Beyond the Kyoto Protocol: Malaysia's Response to Climate Change

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ABSTRACT

BEYOND KYOTO PROTOCOL: MALAYSIA'S RESPONSE TO CLIMATE CHANGE

by

HARKIRANPAL SINGH A/L KARPAL SINGH

In the last century, the world has experienced a drastic change in its climate. In order to prevent this situation from becoming worse, the international community has come up with the United Nations Framework Convention on Climate Change in 1992. As a result of this, the Kyoto Protocol came about in 1998. However, the United States of America which is the world's largest carbon emitter has yet to ratify this Protocol. Currently, the developed nations and the developing nations are in loggerheads over the level of commitment and obligation required and expected of them. Due to this disagreement, most of the developed nations have yet to start fulfilling their obligations in relation to achieving the reduction of the greenhouse gases in their atmosphere. According to the Protocol, the level of commitment and obligation required of a developed nation is far greater compared to than those of the developing nations which are next to nothing. Though, Malaysia being a developing country does not have much obligation, it could do more to help reduce climate change because this problem is a global one and Malaysia has started experiencing the adverse effect of climate change. Malaysia could take those measures which effects will not have an adverse effect on her economy.

ABSTRAK

MENJANGKAUI PROTOKOL KYOTO: RESPONS MALAYSIA TERHADAP PERUBAHAN CUACA

oleh

HARKIRANPAL SINGH A/L KARPAL SINGH

Dalam kurun yang lepas, dunia ini telah mengalami penukaran cuaca yang drastik. Untuk mengatasi masalah ini, pada tahun 1992, "United Nation Framework on Climate Change Convention" telah dirangka oleh badan antarabangsa. Hasil daripada konvensen ini, "Kyoto Protocol" diperkenalkan. Malangnya, Amerika Syarikat yang merupakan negara yang mengeluarkan gas karbon yang tertinggi di dunia, sehingga hari ini masih belum meluluskan protokol ini. Buat masa kini, negara-negara yang sudah membangun dan negara-negara yang sedang membangun mempunyai pandangan yang bertentangan mengenai tahap komitmen dan obligasi masing-masing terhadap protokol ini. Disebabkan tidak persefahaman ini, kebanyakan negara-negara yang sudah membangun tidak mengambil langkah-langkah untuk mengurangkan kesan rumah hijau terhadap atmosfera. Berdasarkan Protokol ini, tahap komitmen negara-negara yang sudah membangun haruslah lebih tinggi daripada negara-negara yang sedang membangun. Walaupun, obligasi Malaysia sebagai sebuah negara yang sedang membangun dalam protokol ini adalah rendah, Malaysia masih boleh mengambil langkah positif untuk mengurangkan perubahan cuaca kerana ini adalah satu masalah global. Tambahan pula, Malaysia telah mula mengalami kesan-kesan negative akibat perubahan cuaca. Malaysia boleh mengambil langkah-langkah untuk menanggani masalah ini tanpa membawa kesan negative terhadap ekonomi negara.

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CHAPTER ONE: INTERNATIONAL ENVIRONMENTAL TREATIES: AN INTRODUCTION

Introduction

Environment refers to "the air, water, minerals, organisms, and all other external factors surrounding and affecting a given organism at any time".[1] Based on this definition, it can be seen that environment consists of three main elements, namely air, water and land. Air affects the Earth climate.

In the last century, the world has experienced a drastic change in its climate. The temperature has increased around 0.6 ° Celsius, but it is estimated that the temperature could increase between 1.4° to 5.8° Celsius over the next century.[2] Such changes will have a serious impact on the environment. Climate has changed over the last century and this has made it difficult to forecast the weather. The weather has been unusual. Countries are getting flooded. The impact of climate change may be tremendous. Though natural events have contributed to this but humans are one of the main contributors. The climate change is due to the greenhouse gases.[3] The increased concentrations of greenhouse gases which consist of carbon dioxide, methane, nitrous oxide, ozone gas, and chlorofluorocarbons ("CFCs") in the atmosphere are the cause of this change. The level of greenhouse gases have increased because of the increase in the use of fossil fuel, cement manufacture, land use, depletion of the earth's ozone layer, animal agriculture and deforestation. The consequence of this is quite severe, namely rising sea level, melting of the Arctic sea ice, warming of the sea-surface temperatures, heavier rainfall, drought and severe weather events.

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[1] http://www.dictionary.com, accessed on 2nd January 2009
[2] United Nations, United Nations Education Programme, *Training Manual on International Environmental Law*, (New York: United Nations, n.d.) at pg 111
[3] See note 2 at pg 111

1.1 Objective of the Project

The main objective of this project is to examine and evaluate how Malaysia can fulfill its obligations and commitments under the Kyoto Protocol and the Bali Roadmap while making no harm to its economy.

The issue of climate change is a global one. It is inappropriate for any one country to point fingers at other states. Thus, various actions have been initiated at the international arena. The most prominent one has been ***the UN Framework Convention on Climate Change (UNFCCC)*** which was adopted in 1992. It sets out a framework with the main objective of stabilizing atmospheric concentrations of greenhouse gases in order to prevent change in the climate. As a consequence of this, ***the Kyoto Protocol*** came about. Various agreements were reached in terms of mechanisms, carbon sinks, compliance and financing. ***The Kyoto Protocol*** is viewed as the most ambitious environmental treaty. This ***Protocol*** sets legally binding emission reduction requirements for the industrialized countries. The most recent development has been ***the Bali Roadmap***.

To fulfill the abovementioned primary objectives, three significant concerns have been identified as supplementary objectives:

- To examine, interpret and evaluate ***the UNFCCC, the Kyoto Protocol*** and ***the Bali Roadmap***;
- To identify, examine, and evaluate how Malaysia has responded so far; and
- To propose how Malaysia can fulfill its obligations and commitments under ***the Kyoto Protocol*** and ***the Bali Roadmap*** while making no harm to its economy financially.

1.1.2 Structure of the Project

The purpose of this study is to examine and evaluate how Malaysia can fulfill her obligations and commitments under ***the Kyoto Protocol*** and ***the Bali Roadmap*** while making no harm to her economy. Hence, this study starts with Chapter Two on "Sources of Climate Change". Under this chapter, an extensive study has been done on what are the sources of climate change and why have they occurred?

Subsequently, Chapter Three is on "The Climate Change Convention Regime". This chapter looks at the various policies on climate change and their legal implications. This chapter starts of with ***the United Nations Framework Convention on Climate Change f***ollowed by ***the Kyoto Protocol***, ***Bonn Conference*** and finally ***the Bali Roadmap***. The outcome of the 14th Conference of Parties will also be discussed.

Chapter Four is "Malaysian Obligations and Initiatives". This chapter looks at what Malaysia's obligations are and how Malaysia has responded so far with regards to the climate change convention regimes. This chapter looks into the rules and regulations pertaining to climate change and also the flexible mechanisms, namely the Clean Development Mechanism, which was introduced by ***the Kyoto Protocol*** to offer options to developing countries to participate in climate change mitigation.

Chapter Five is on the "Proposed Actions and Analysis". It proposes and analyses the actions that Malaysia could take in order to reduce the emission of greenhouse gases without hurting its economy.

The final chapter in this research project is Chapter Six which is "In Conclusion". This chapter will conclude the research and recommend a few proposed action plans which Malaysia can take to help reduce the change in the earth's climate. This chapter will

describe how Malaysia can fulfil her obligations and commitments under the Kyoto Protocol and the Bali Roadmap while making no harm to her economy.

This research will be concluded with "Bibliography" and finally the "Appendix".

1.2 Scope of the Project

The scope of this project will be confined to the Malaysian perspective only. Thus, this project demonstrates how Malaysia can fulfill her obligations and commitments under ***the Kyoto Protocol*** and ***the Bali Roadmap*** while making no harm to her economy.

1.2.1 International Environmental Treaties on Climate Change

154 countries in 1992 signed ***the United Nations Framework Convention on Climate Change*** (hereinafter referred to as ***UNFCCC***). ***The UNFCCC*** relied upon on the concept of 'common but differentiated responsibilities', whereby the commitments of each country were fixed based to the economic status of them. This resulted in only developed states and countries with economies in transition having a fixed obligation in order to achieve specified emission reductions with the ultimate aim of controlling the climate. At the same time, developing countries can voluntarily take on commitments to limit emissions, but are not required to do so. However, all state parties to this convention are obliged to develop national programmes in order to generally mitigate the causes and effects of climate change.

The UNFCCC is not specific. It is only a framework. It was created as a basis for future action namely ***the Kyoto Protocol***. The objective is to reduce the greenhouse gas. As a result of ***the UNFCCC***, ***the Kyoto Protocol*** came about in 1997 with the main purpose to consider what can be done to reduce Global warming. This treaty involved most world countries with the exception of the United States of America.

In 2007, there was a meeting on climate change in Bali, Indonesia where there was a divisive debate on whether there was a need to change ***the Kyoto Protocol*** or replace it with a new agreement. There was a call from the developed nations for stronger obligations on climate change for the developing nations. The conclusion of this meeting was ***the Bali Roadmap*** where there was an agreement towards building on ***the Kyoto Protocol***.

1.2.2 The Malaysian Case Study

Malaysia being a developing nation can voluntarily take on commitments to limit emissions, but are not required to do so. It is not required to reduce the greenhouse gas emission. In response to ***the UNFCCC*** and ***the Kyoto Protocol***, Malaysia has taken some positive actions including being active in the Clean Development Mechanism and looking into energy efficiency and renewable energy resources. Malaysia has also prepared a document called Initial National Communications where it reported on the national greenhouse gas level as well as the recorded activities undertaken to address the issue of climate change. A comprehensive study will be done in the subsequent chapters to analyse what Malaysia has done and what else Malaysia can do with regards to climate change.

1.3 Methodology

This section is divided into literature review and a comment on the fieldwork. The literature review will focus mainly on the theoretical portion of the project. There are comments on the materials for the Malaysian part of the project which will be dealt with in the fieldwork part.

1.3.1 Literature Review

A lot of good literature can be found in books and journals on the area of international law especially Climate Change. They were gathered from the secondary sources primarily made available in the library. They were journal articles, books, theses, research or working papers, credible news papers and electronic, namely: -

1) Sands, P., *Principles of International Law;*[4]
2) Dixon M, *Textbook on International Law;*[5]
3) The United Nations, United Nations Education Programme, *Training Manual on International Environmental Law;*[6]
4) McEldowney, J.F. & McEldowney, S., *Environment and the Law: An Introduction for Environmental Scientists and Lawyers.*[7]

The Malaysian position was found in M. Sabri Yusof, *International Environmental Law*[8] and Sahabat Alam Malaysia, *Malaysian Environment in Crisis.*[9] Suzanna Mohamed Isa, *Environmental Law in Malaysia*[10] has also given the Malaysian position on environmental law.

1.3.2 The Malaysian Fieldwork

The research done here was of the qualitative type. This is important because important views and arguments can be obtained which will be subsequently analysed and evaluated in order to answer the research questions. The main problem here was the time constraint in doing the research and the difficulty of arranging interviews with the respective respondents.

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[4] Cambridge University Press, Cambridge.
[5] Blackstone Press, London, 1990.
[6] United Nations, New York, n.d.
[7] Addison Wesley Longman, Harlow, Essex, 1996.
[8] ILBS, Kuala Lumpur, 2000.
[9] Jutaprint, Penang, n.d.
[10] Penerbit UKM, Bangi, 2006.

This information was obtained from the Ministry of Natural Resources and Environment, the Environmental Protection Society Malaysia, Malaysia Energy Centre and the University of Malaya Centre for Climate Change Affairs.

The following questions which were posed focused on the following areas: -

1) The seriousness of the global climate change.
2) The seriousness of climate change in Malaysia.
3) The main contributors of climate change.
4) The main contributors of climate change in Malaysia.
5) The actions taken by Malaysia so far.
6) The Clean Development Mechanism programme.
7) Comments on the possible action Malaysia could take.

Professor Dr. Khairulmaini bin Osman Salleh from the University of Malaya Centre for Climate Change Affairs was interviewed on 17th February 2009 in the Department of Geography, Faculty of Arts and Social Sciences, University of Malaya, Kuala Lumpur. The purpose of the interview was to get the scientist perspective of climate change and to ascertain whether the proposed actions were feasible from the point of view of science. The following questions were asked:

1. How serious is the global climate change situation?
2. What is the situation in Malaysia?
3. Has Malaysia experienced any change in the climate lately?
4. What are the main contributors of climate change in Malaysia?
5. What has Malaysia done so far to mitigate the effect of climate change?
6. What can Malaysia do on its part to reduce the rate of climate change?

Ms. Radin Diana R. Ahmad and Ms. Noorly Akmar Ramli, Research Officers from the Policy Analysis and Research Management of Malaysia Energy Centre were interviewed on the 19th of February, 2009 in her office in Bangi with the sole purpose of obtaining more information about the Clean Development Mechanism (CDM). The following questions were asked during the interview: -

1) What is the role of the Malaysia Energy Centre?
2) How does the Malaysia Energy Centre promote CDM?
3) What types of projects qualify as CDM in Malaysia?
4) Which is the most popular?
5) How many applicants have there been for the CDM projects since 2002?
6) How many have been registered?
7) How many companies have issued with the CER (Certified Emissions Reduction)?
8) How many have been registered but did not pursue with the issuance of CER?
9) Where are most of the foreign partners from?
10) How long does it take to process one application?
11) How is the response so far?
12) How successful is Malaysia in CDM compared to Thailand and Indonesia?

Ms. Siti Khadijah Abdul Ghani, the Assistant Secretary from the Environmental Management and Conservation Division, Ministry of Natural Resources and Environment (NRE) was interviewed on the 26th of February 2009 at the Ministry of Natural Resources and Environment in order to get more information about what Malaysia has done so far and get her opinion about the possible action Malaysia could take about climate change and the CDM.

The Environmental Protection Society Malaysia Advisor and Founder President, Mr. Gurmit Singh was interviewed on 17th March 2009 at his premises at no. 17 Jalan SS2/53,

Petaling Jaya, Selangor. Mr. Maximilian T. Conrad, the Assistant Secretary from the Environmental Management and Conservation Division, Ministry of Natural Resources and Environment (NRE) was interviewed on 30th March 2009. The purpose of these interviews was to get climate change experts' opinion about the actions which were proposed for Malaysia to take in order to reduce climate change. The following questions were asked:

1) Do you agree that any action taken should focus on three main strategies - mitigation, science and vulnerability (adaptability)?
2) In order to take measures to be adaptable, what is your opinion about having a national policy that focuses solely on climate change?
3) Should Malaysia do more in the area of science in climate change by proving local data to confirm the change of climate, thus creating the sense of urgency in the international arena to take appropriate action to reduce this change?
4) What is your opinion on the following measures to reduce carbon emission?
    a) Setting its carbon dioxide emissions reduction target, perhaps by year 2020.
    b) Passing new laws to combat climate change. Which area should this law cover?
    c) Having a better system of governance and tighter enforcement. How can this be done?
    d) Transportation
        a. Improving the public transport
        b. Stricter checks on Buses, Taxis and Lorries by PUSPAKOM
        c. Encourage car pool – collaboration between Information Ministry, Transport Ministry and NRE.
        d. Encourage hybrid cars – collaboration between NRE, Transport Ministry, Finance Ministry & Information Ministry- create awareness and reducing taxes
        e. Do more to encourage usage of gas in cars? Natural Gas Vehicles
    e) Encourage the use of alternative form of energy rather than fossil fuel

a. What is your opinion about nuclear energy? TAR suggested it

b. Giving incentives for the development and use of renewable energy such as solar, biomass or wind.

f) Malaysia should have new laws and tighter enforcement on open burning which should include having laws that punish Malaysian companies who are responsible for haze in other countries.

g) Have mitigation strategies in the agriculture sector to reduce/offset GHG emission e.g. carbon sequestration in agricultural soils or use of tree shelterbelts – minimize soil erosion and stabilize soil carbon.

h) Take measures in the Manufacturing Sector to reduce emission by

a. energy efficiency

b. Fuel switching

c. Monitoring

d. Waste management

e. Train employees

i) Take measures to increase carbon sink by reduced deforestation

5) Though there have been campaigns organized by the public and private sectors and non-governmental organizations but according to the Conservation and Environmental Management Division (CEMD) of the Ministry of Natural Resources and Environment (NRE), the response has been lukewarm.[11] Therefore, a different approach and strategy should be undertaken.

a. What is your opinion about collaboration between various Ministries such as the Education Ministry, the Information Ministry, Transport Ministry, the Human Resources Ministry and the Ministry of Natural Resources and Environment in order to create awareness among Malaysians about climate change?

[11] Malaysia, Conservation and Environmental Management Division (CEMD), Ministry of Natural Resources and Environment, *Climate Change in Malaysia*, (Putrajaya: CEMD, 2005) at pg 17.

b. What is your opinion about the Ministry of Natural Resources and Environment collaborating with the Human Resource Ministry to encourage and help them create training programmes on the importance of taking measures to reduce climate change?

c. What is your opinion about

   i. the Education Ministry and the Ministry of Natural Resources and Environment collaborating in order to create awareness among students? And

   ii. having a subject on climate change at the primary, secondary and tertiary level of school to increase public education and awareness with regard to global warming and climate change matters.

6) What is your opinion about the CDM? How is the response so far? Is Malaysia doing enough in terms of awareness and areas?

Conclusion

In conclusion, this chapter sets the centre stage for the research project which has been done on the area of climate change. It looked at the objective and scope of the project plus briefly introduced the international environmental laws on climate change which will be analysed in Chapter Three. Finally, it also looked at the methodology used for the research.

CHAPTER TWO: SOURCES OF CLIMATE CHANGE PROBLEM

Introduction

The unprecedented change in the climate over the last century has been primarily due to human intervention. Actions taken by man have resulted in the climate changing more rapidly than anticipated. Mankind being the dominant inhabitant of earth is set to suffer due to this climate change. The climate change is mainly to due the rise in the greenhouse gas in the atmosphere. This results in air pollution. Air pollution is said to have occurred when there is a contamination of the atmosphere due to discharge of numerous toxic airborne substances which may be either accidental or deliberate.[12] There are various sources of it and humans are the main cause of these sources.

2.1 What are the sources and why have they occurred?

It has been recognized that human activities are the main culprits of climate change. This is apparent from the evidence collected by scientists which showed that that there have been changes in temperature, rainfall and other weather variables, for example, the average world temperature increased by 0.6° Celsius over the 20th Century.[13] The main source of climate change is the greenhouse gases. Greenhouse gases consist of carbon dioxide, methane, nitrous oxide, hydroflourocarbons, perflourocarbons and sulphur hexafluoride. According to the IPCC report 2007, the activities that contribute towards the greenhouse gases are as follows[14]: -

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[12] Suzanna Mohamed Isa, *Environmental Law in Malaysia*, (Bangi: Penerbit UKM, 2006) at pg 19.
[13] United Nations, United Nations Education Programme, *Training Manual on International Environmental Law*, (New York: United Nations, n.d.) at pg 111
[14] Cheryl Rita Kaur, "Addressing Global Warming in Malaysia", *IMPAK*, 2008, 2

Table 2.1: Activities that contribute towards the greenhouse gases

Greenhouse Gas	Activities that contribute towards emissions
Carbon dioxide	Fossil fuels, cement production, land use change
Methane	Fossil fuels, rice paddies, waste dumps, livestock
Nitrous oxide	Fertilisers, combustion in industrial processes
Hydroflourocarbons	Electronics, refrigerants, industrial processes
Perflourocarbons	By-products of aluminium smelting, purging agent for semi-conductor manufacturing
Sulphur hexafluoride	Insulation of switchgear in the power station

The Intergovernmental Panel on Climate Change (IPCC) which was established in 1988 jointly by the World Meteorological Organisation (WMO) and the United Nations Environment Programme (UNEP) highlighted that the single largest contributor to the increase in the carbon dioxide in the atmosphere is fossil fuels.[15] The same report also stated that the global carbon dioxide emissions are growing faster than at any time since 1970.[16] It was also reported that the levels of carbon dioxide are around the highest in at least 800,000 years and up by about a third since the industrial revolution.[17] Over 60% of the greenhouse effect is due to carbon dioxide. The carbon dioxide emissions from burning of fossil fuels are shown below[18]: -

[15] See note 14
[16] See note 14
[17] Roche, A., "CO2 hits new peak, no sign global crisis causing dip", *Reuters*, 12 February 2009, Reuters, 18 February 2009 http://blogs.reuters.com/environment/
[18] M. Sabri Yusof, *International Environmental Law*, (Kuala Lumpur: ILBS, 2000) at pg 52.

Table 2.2: The carbon dioxide emissions from burning of fossil fuels

Carbon Dioxide Emissions from Burning of Fossil Fuels	
Million Tonnes/Percentage of World Total (1996)	
• World Total	6 billion tones in 1996
• United States	1.430 / 22.9%
• Europe	870 / 14.5%
• Russia	432 / 7.2%
• China	750 / 13.3%
• Japan	300 / 5.0%
• Rest of the World	2,200 / 37.1%

(Sources: BBC World Service, U.S. Energy Information Administration, Greenpeace)

The increase of the greenhouse gases has occurred due to human intervention and also the sudden increase of the world's population over the last century. This increase in the emission of these greenhouse gases is due to the general economic growth which has taken place, especially after the 1950s, as well as increased levels of consumption, including the increased demand for electricity and the use of cars.[19] The increase of carbon dioxide is due to human activities such as burning coal, oil and natural gas (fossil fuels), as well as agricultural activities and deforestation.[20] The burning of fossil fuels mainly due to industrial activities, vehicle exhaust fumes, smoking and use of petrochemical products in buildings releases stored carbon thereby increasing the overall percentage of carbon dioxide in the atmosphere. Other than carbon dioxide, CFCs and

[19] See note 13 at pg 111
[20] See note 13at pg 111

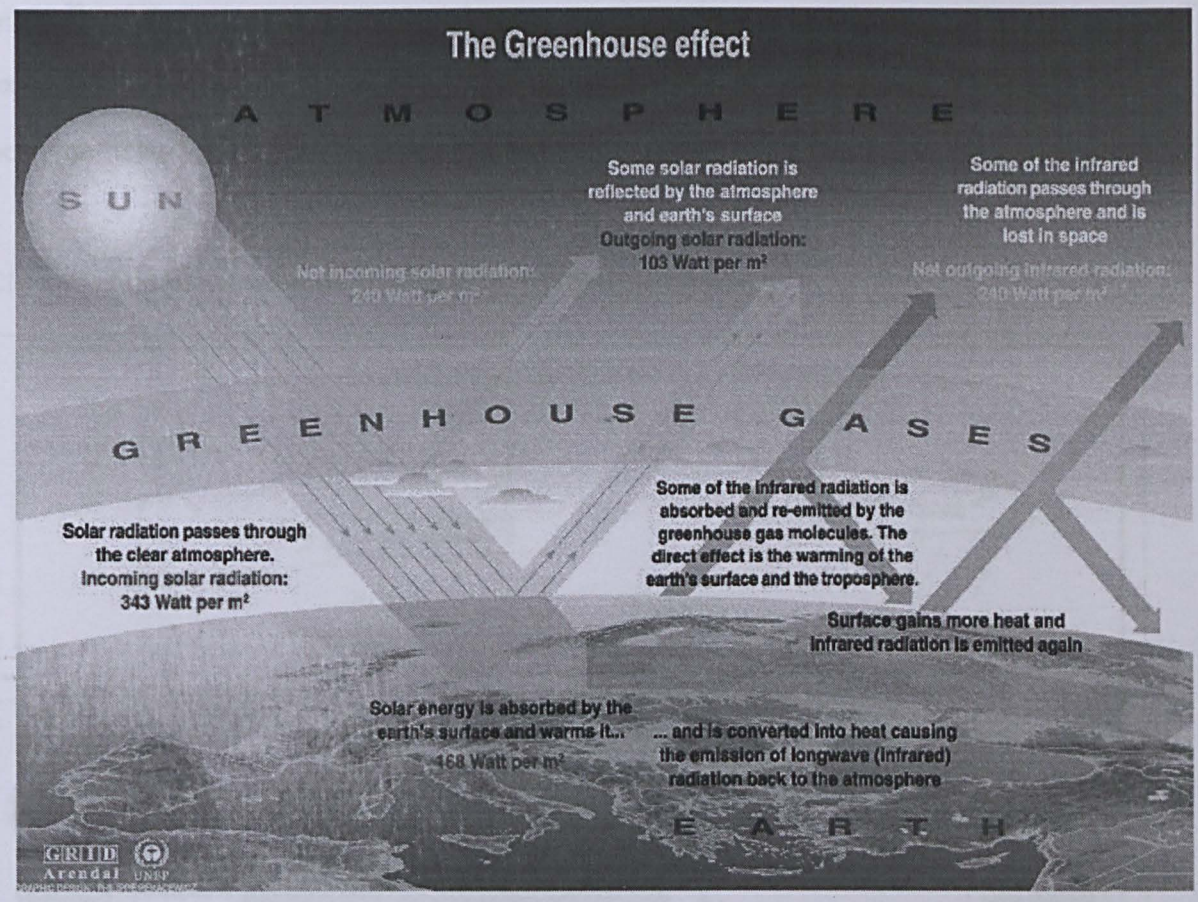
methane are also being emitted to the atmosphere as a result of human activities.[21] Methane and nitrous oxide are emitted from agricultural activities, changes in land use and other sources.[22] The industrial processes release artificial chemicals called halocarbons (CFCs, HFCs and PFCs) and other long lived gases such as sulphur hexafluoride (SF6).[23] Apart from that, automobile exhaust fumes indirectly generate ozone to the atmosphere. This not only decreases the quality of air but also affects the climate.

These greenhouse gases can be absorbed by the oceans and forests. They are known as greenhouse gas "sinks." However, with deforestation, the previously stored greenhouse gases are released and this contributes further to the increase of greenhouse gases in the atmosphere.[24] Even if emissions from human activities were to stop immediately, the effects of the emissions already accumulated may persist for centuries because most greenhouse gases remain in the atmosphere for a long period of time.[25]

2.2 What are the consequences of Climate Change?

The greenhouse gases cause climate change which result in global warming. Global warming is the outcome in an increase in the earth's average temperature. Global warming occurs because the greenhouse gases are trapped in the earth's atmosphere near the earth's surface which results in the earth being warmer than it should be.[26] This is illustrated in the Figure 1 below: -

[21] See note 13 at pg 111
[22] See note 18 at pg 48
[23] See note 18 at pg 48
[24] See note 13 at pg 111
[25] See note 13 at pg 111
[26] See note 14



(Source: http://severnsound.ca/images/3.jpg)

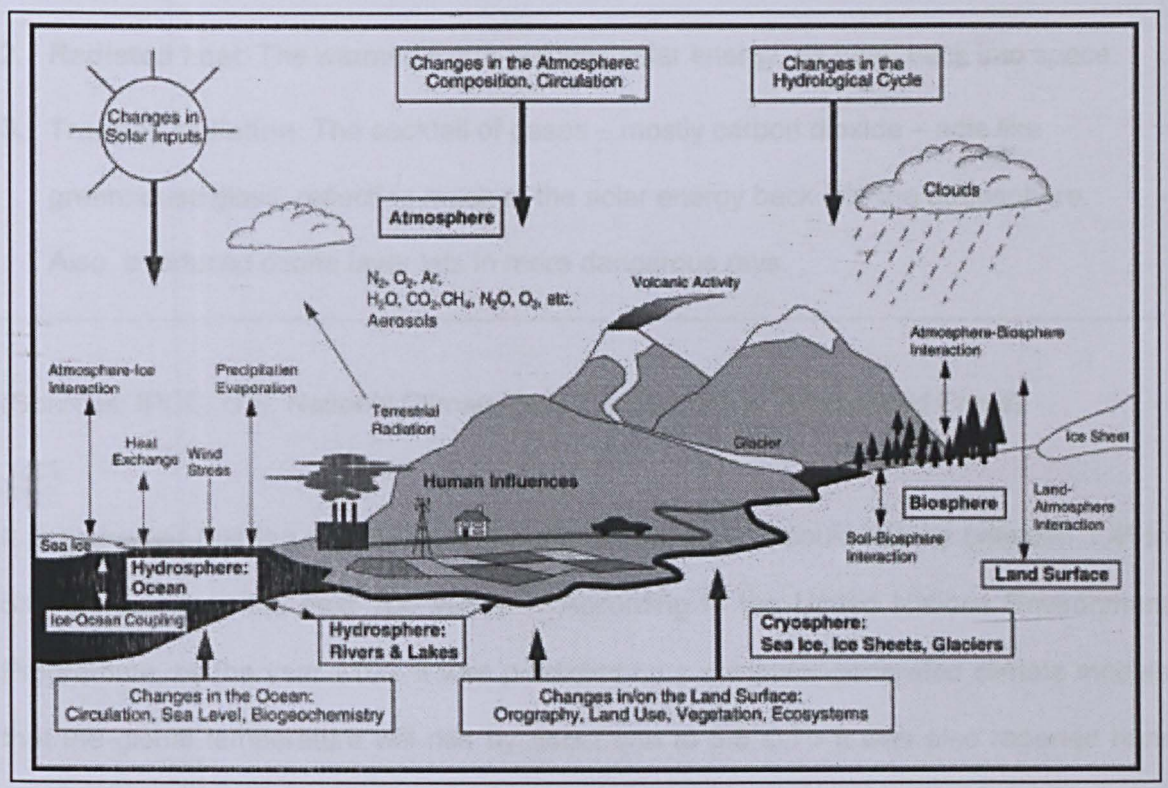
Figure 2.1: The greenhouse effect

The greenhouse gases keep the earth hospitable by allowing incoming solar radiation to go through, but they absorb the outgoing terrestrial radiation emitted by the earth's surface and re-radiate it back to earth.[27] Lately, due to the increase in the greenhouse gases in the earth's atmosphere, the earth's blanket is trapping more heat which has resulted in an increase in the global temperature and causing the sea level to increase and increasing the intensity of extreme weather events.[28] This acts like a greenhouse on the earth's surface. The change in the climate has affected the agricultural yields, glacial retreats, species extinction and the increase in the range of disease vectors around the

[27] See note 14
[28] See note 14

world.[29] If the current trend of global warming continues, it will eventually cause the extinctions of various species. This can be seen by the fact that the loss of habitat and pollution has affected various plant and animal species.

Climate change can also be illustrated in the diagram below: -



(Source: Centre for Environment, Technology and Development, Malaysia (CETDEM))

Figure 2.2: Climate change

[29] See note 14

The effect of the greenhouse gases can be summarized below[30]: -

Table 2.3: The greenhouse effect

The Greenhouse Effect
1. **Sunlight**: Earth's atmospheric blanket of gases allows most of the sun's radiation to pass through.
2. **Radiated heat**: The warmed Earth radiates solar energy, as heat, back into space.
3. **Trapped radiation**: The cocktail of gases – mostly carbon dioxide – acts like greenhouse glass, reflecting much of the solar energy back into the atmosphere. Also, a reduced ozone layer lets in more dangerous rays.

(Sources: IPCC, U.S. National Climate Data Center, Reuter, Associated Press)

It is estimated that the global average surface temperature could rise by between 1.4° to 5.8° Celsius over the next 100 years.[31] According to the United Nations Environment Programme, by the year 2100, it was predicted by a computer-generated climate models that the global temperature will rise by about one to 3.5°C.[32] It was also reported here that there evidence to suggest that the climate may have already started responding to past emissions.[33] The rise of sea-level is expected to be the immediate effect of global warming.[34] The average sea level is predicted to rise by up to eighty-eight centimetres by the end of the twenty first century, posing a serious threat to low lying delta systems and small island states.[35] In the United Nations Environment Programme, it was stated that the sea level is expected to rise 15 cm to 95 cm by the year 2100 which will result in

[30] See note 18 at pg 50
[31] See note 13 at pg 111
[32] See note 18 at pg 48
[33] See note 18 at pg 48
[34] Goldberg, D.M. *As the World Burns: Negotiating the Framework Convention on Climate Change: International Environmental Law Vol. II,* (UK: Dartmouth Publishing Co., 2003) at pg 131
[35] See note 13 at pg 111

flooding in low-lying areas.[36] It was also reported that climate zones (ecosystems and agricultural zones) could shift towards the poles by 150 km in the mid-latitude regions. To make matters worse, the human society will face new risks and pressures namely shortages of food in some areas plus water resources will be affected as precipitation and evaporation patterns change around the world.[37] This will result in the extinction of those species that are not able to adapt well to this change of environment. The summary of evidence of global warming is shown below[38]: -

Table 2.4: Evidence of global warming

Evidence of Global Warming	
Rain and snow	10% decrease since 1970
Sea levels	10-25 cm rise in last 100 years
Ice caps	Retreating
Glaciers	Retreating
Night-time temperature	Rising faster than daytime temperatures since 1950
Near-surface ocean and air temperatures	Up 0.3 – 0.6 °C since late 19th century

(Sources: IPCC, U.S. National Climate Data Center, Reuter, Associated Press)

In the recent wildfire in southern Australia in early 2009 which left more than 160 people dead, it was suggested that global warming may have played a part in it.[39] This was

[36] See note 18 at pg 48
[37] See note 18 at pg 48
[38] See note 18 at pg 49
[39] Walsh, B., "Why Global Warming May Be Fueling Australia's Fires", *Time*, 9 February 2009, Time Inc, 18 February 2009 http://www.time.com/time/health/article/0,8599,1878220,00.html?xid=rss-health

warned by the IPCC in the 11th chapter of the second working group in 2007 where it was stated fires in Australia were "virtually certain to increase in intensity and frequency" due to steady increase in the temperature over the next several decades.[40] Even in the Australian government's own Commonwealth Scientific and Industrial Research Organisation in 2007 reported that by 2020 there could be up to 65% more "extreme" fire-dangers compared with 1990 and that by 2050, under the most severe warming scenarios, there could be a 300% increase.[41]

2.3 Malaysia

Malaysia should not take the threat of climate change lightly. The potential threat was highlighted by Khairulmaini who said

> "The potential threat of climate change–induced hazards on economic development and progress in Southeast Asia should not be taken lightly. The most recent IPCC analysis reports a comparatively smaller increase in temperature for the Southeast Asian region in the last 50 years or so relative to the warming in higher latitudes. Yet there is general agreement among scientists that the changing behavioral patterns of LOPCs, El Niño, and other weather events are triggering hydrometeorological and geomorphological events such as floods, droughts, haze pollution, and slope failures. To date, the impact of these changes can still be absorbed by the strong foundations of Southeast Asia's environmental management programs and backed by its stringent economic policies, including effective poverty eradication programs. However, this scenario can change if the gradual increase in global warming is left unchecked and leads to threshold breaches where habitats and ecosystems cannot recover their equilibrium."[42]

According to the Environment Department of the World Bank in 2007, Malaysia recorded one of the highest percentage increase in carbon dioxide emissions over the past 10 years.[43] Malaysia was among the top 20 countries listed with a 73% increase in carbon dioxide emissions between the year 1994 and 2004. This increase is alarming because

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[40] See note 39
[41] See note 39
[42] Michel, D. & Pandya, A., ed., *Climate Insecurity in Southern Asia: Designing Policies to Reduce Vulnerabilities*, (Washington, DC: Stimson, 2009).
[43] See note 14 at pg 19

Malaysia may suffer from the direct impacts of climate change which could result in the rise in the sea-levels.[44] This may threaten the national coastal ports, low-lying coastal areas, small islands around Malaysia, affect the ecosystem, coral bleaching and threaten the agricultural sector.[45] All of this in turn will affect Malaysia's economy. This is because coral reef is important not only for the tourism industry but also to the fishing industry. Unfortunately, 85% of the reefs of Malaysia are threatened in Malaysia due to various reasons like increase in ocean temperature, increases in the atmospheric concentrations caused by greenhouse gases, rising sea level, pollution and so on.[46]

Mangrove forest also plays an important role as it helps reduce the level of carbon dioxide in the atmosphere (carbon sink). However, the mangrove forests in Malaysia are reducing due to rising sea levels and other human activities for example Tanjong Piai Ramsar site.

Some of the impacts of climate change can be seen in Malaysia, for example, the unseasonal floods in Johor in 2007 and the temperature increase in Cameron Highlands.[47]

On 5 March 2009, it was reported in the Star that on 3 March 2009, Kuala Lumpur saw more rain than it normally would in two months in just two hours.[48] This rain was so intense that it caused Sungai Gombak to quickly swell and overflow which resulted in the flood havoc in several parts of Kuala Lumpur.[49] The Department of Irrigation and Drainage Director-General, Datuk Ahmad Husaini Sulaiman said 75 mm of rainfall was recorded within two hours which was abnormal because normally 30 mm is received in a

[44] See note 14 at pg 19
[45] See note 14 at pg 19
[46] Cheryl Rita Kaur, "Effects of Climate Change on Coral Reef Ecosystems", *IMPAK*, 2008, 3
[47] See note 14 at pg 19
[48] Florence A. Samy, "Two months of rain in just two hours", *The Star*, 5 March 2009, 3.
[49] See note 48

month here.[50] This unusual intensity of rain fall is another indication of climate change which is occurring in Malaysia. Any change to climate change will also affect those lower income groups who are considered as being vulnerable because they may end up losing their livelihood and source of income. This could be seen from the flood resulting from the unusual rain fall in Kuala Lumpur on 3 March 2009 which resulted in many businesses in that flooded areas to be affected and forced to close down for a few days to clean the mess which was caused by the flood.[51] Khairulmaini Osman Salleh said

> "As in most developing regions, many of Southeast Asia's rural economic practices and modern economic production systems are governed by the condition of the environment and behavior of the seasons. Increasing climate extremes and variability will severely affect the region's natural environment. Indonesia, Malaysia, the Philippines, and Vietnam, which have very long coastlines and many islands, are threatened by sea-level rise. Southeast Asia's biodiversity-rich forests, water resources, and marine ecosystems, including its very rich coral reefs, are threatened by increasing land and sea temperatures. Damage to any or all of these could have serious ramifications for agriculture, fishing, tourism, energy, rural-urban commerce, and international trade.
>
> The latest available national estimates of poverty based on national studies show that 36 percent of the population of Cambodia lives below its national poverty line, 17 percent of Indonesia, 32 percent of Laos, 5 percent of Malaysia, 27 percent of Myanmar, 30 percent of the Philippines, 12 percent of Thailand, and 27 percent of Vietnam. Adapting to climate change will cost individual households as they attempt to sustain their comfort, health, and livelihoods; the costs will increase as climate change worsens.
>
> Climate change, through its effects on water availability and seasonality, could affect rural agriculture productivity and forest biodiversity. The economic performance of the fishing communities of the northeastern region of peninsular Malaysia, the eastern region of Vietnam, southern Thailand, and many parts of the Philippines is largely dictated by weather conditions in the South China Seas, such as LOPCs, El Niño, and the northeastern monsoon."[52]

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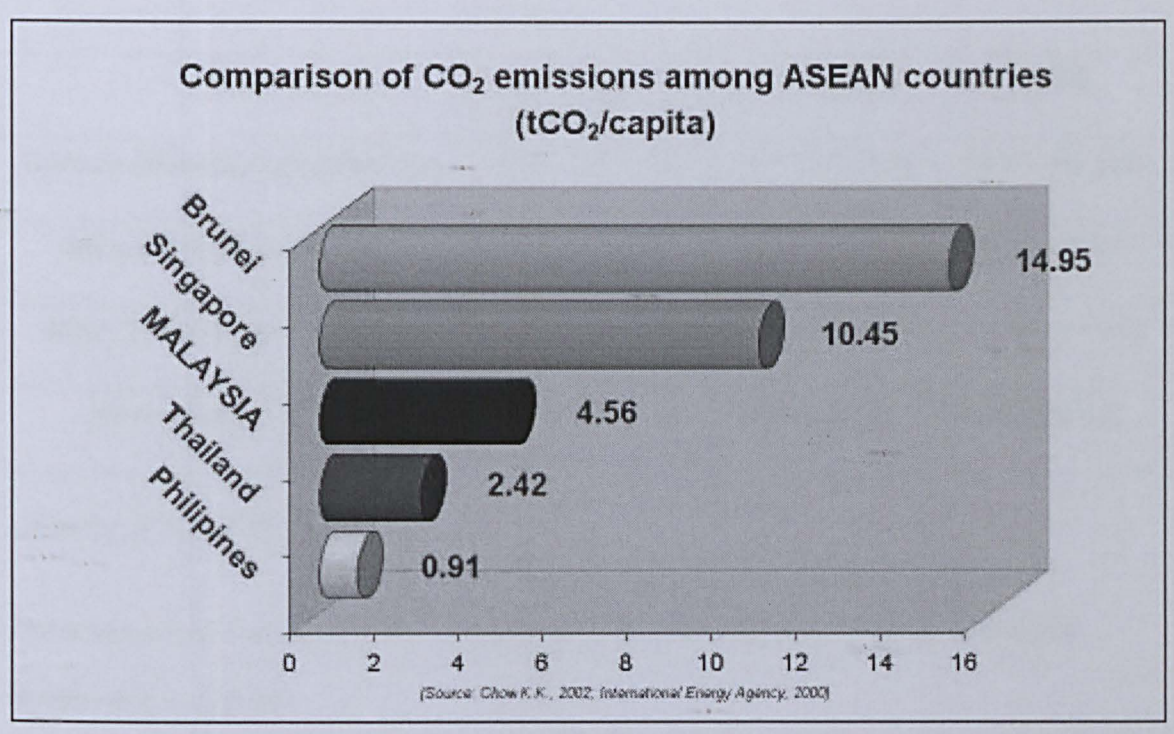
[50] See note 48

[51] Fazleena Aziz, "Massive flood causes havoc in Kuala Lumpur", *The Star Metro*, 5 March 2009. M1-3

[52] Michel, D. & Pandya, A., ed., *Climate Insecurity in Southern Asia: Designing Policies to Reduce Vulnerabilities*, (Washington, DC: Stimson, 2009).

Malaysian emission of carbon dioxide gas in comparison to other ASEAN countries is shown below: -



(Source: Centre for Environment, Technology and Development, Malaysia (CETDEM))

Figure 2.3: Comparison of carbon dioxide emissions among ASEAN countries

Below are the climate scenarios for Malaysia based on the Third Assessment Report (TAR) of the IPCC: -

Table 2.5: The climate scenarios for Malaysia based on Third Assessment Report (TAR) of the IPCC

Year	2025	2050	2100
Carbon Dioxide Concentration	405 - 460 ppm	445 - 460 ppm	540 - 970 ppm
Mean Temperature Rise	0.2 - 0.4 Â°C	0.3 - 1.0 Â°C	0.6 - 2.3 Â°C
Mean Precipitation Change	- 5 % to + 5 %	- 5 % to + 5 %	- 5 % to + 5 %
Mean Sea-Level Rise	3 - 14 cm	5 - 32 cm	9 - 88 cm

(Source: IPCC, 2001)

The socio-economic impacts in Malaysia as a result of sea level rise due to climate change are as follows:

Table 2.6: The socio-economic impacts in Malaysia as a result of sea level rise

Type of Impact	Socio-economic Impacts based on the High Rate of Sea Level Rise (0.9cm/yr)
Loss of agricultural production from eroded/inundated lands	RM 46 million for Western Johor Agricultural Development Project area. The West Johor Project area accounts for about 25% of the national drainage areas
Displacement and relocation of flood victims with associated disruption of business / economic activities resulting from increased flooding	Long-term annual flood damage estimated at about RM88 million for Peninsular Malaysia and RM12 million for Sabah / Sarawak based on 1980 price level. If the flood frequency is doubled, the annual flood damage will increase by 1.67 times
Loss of fisheries production due to mangrove loss	

(Source: Centre for Environment, Technology and Development, Malaysia)

Conclusion

Based on the facts above, it can be seen that the global warming due to climate change has been induced by humans. The effect of global warming is not only apparent in Malaysia but also in other parts of the world. Thus, the concentration of the greenhouse gases must be reduced in order to stabilize the environment.

CHAPTER THREE: THE CLIMATE CHANGE CONVENTION REGIME

Introduction

The main climate change regime is ***the United Nations Framework Convention on Climate Change (UNFCCC***) which was subsequently followed by ***the Kyoto Protocol***. The Protocol states the amount of commitment and obligation required of the various parties.

3.1 The Development of the Climate Change Regimes

The phenomenon of global warming was first discussed in international conferences back in the 1980s.[53] This was when the United Nations Environmental Program ("UNEP") and the World Meteorological Organization ("WMO") was established and still cosponsor an independent scientific body called the Intergovernmental Panel on Climate Change ("IPCC").[54] Neither research nor monitoring of climate related data nor parameters are done by the IPCC. The main purpose of this is to collect scientific information about the causes of climate change, its potential effects and possible ways to mitigate these effects.[55] The IPCC consists of over 2000 scientific and technical experts from around the world who collect scientific information about the causes of climate change, its potential effects and possible ways to mitigate these effects.[56] The First Assessment Report (FAR) was issued by the IPCC in 1990, describing the likely threats of climate change, and subsequently produced its Second Assessment Report (SAR) in 1995, and Third Assessment Report (TAR) in 2001.[57] The Fourth Assessment Report (AR4) was completed in 2007. Until today, about four assessment reports have been produced. FAR helped launch negotiations on ***the United Nations Framework Convention on***

[53] United Nations, United Nations Education Programme, *Training Manual on International Environmental Law*, (New York: United Nations, n.d.) at pg 111
[54] See note 53 at pg 111
[55] See note 53 at pg 111
[56] See note 53 at pg 111
[57] See note 53 at pg 111

Climate Change (UNFCCC). SAR was made available to the second Conference of the parties (COP 2) in 1996 which provided the basis for the negotiation which led to the adoption of ***the Kyoto Protocol***. TAR was submitted to COP 7.

The negotiation process for the climate change regime is one of the most challenging because most developing countries have been unwilling to take on onerous commitments, arguing that it was mainly the developed states which had contributed to the increase in global warming as part of their economic development.[58] At the same time, several developed states were concerned about the impact a firm commitment to reducing emissions would have on their economies.[59]

In 1992, 154 states signed ***the United Nations Framework Convention on Climate Change (UNFCCC)***.[60] The key to ***the UNFCCC***'s completion was the explicit reliance on the concept of 'common but differentiated responsibilities', that is the commitments were fixed according to the economic status of each country with the result that, at present, only developed states and countries with economies in transition (EIT) have a fixed obligation to achieve specified emission reductions.[61] This is shown in Annex I of ***the UNFCCC*** ("Annex I Parties"). At the same time, developing countries can voluntarily take on commitments to limit emissions, but are not required to do so.[62] However, all state parties to ***the UNFCCC*** are obliged to develop national programmes in order to generally mitigate the causes and effects of climate change.[63]

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[58] See note 53 at pg 111
[59] See note 53 at pg 111
[60] See note 53 at pg 111
[61] See note 53 at pg 111
[62] See note 53 at pg 111
[63] See note 53 at pg 111

The main stages in the negotiation process are summarized below:

Table 3.1: Key stages in the climate change convention regime

Key Stages in the Climate Change Convention Regime	
1988	UNGA Resolution 43/53 recognizes climate change a "common concern of mankind"
1988	UNEP and WMO establish the Intergovernmental Panel on Climate Change ("IPCC")
1990	The UN launches negotiations on a framework convention on climate change
1992	***The United Nations Framework Convention on Climate Change*** is adopted in New York and opened for signature at the Earth Summit in Rio de Janeiro, Brazil; the Convention receives 154 signatures and enters into force in 1994
1995	The first Conference of the Parties ("COP-1") in Berlin, Germany launches a new round of negotiations to strengthen the targets of Annex I Parties ("Berlin Mandate") IPCC Second Assessment Report concludes that the balance of evidence indicates a discernable human influence on the global climate
1996	COP-2 in Geneva, Switzerland clarifies the scope of the Berlin Mandate
1997	COP-3 Kyoto, Japan, adopts ***the Kyoto Protocol***
1998	COP-4 Buenos Aires, Argentina adopts the 'Buenos Aires Plan of Action' setting out a program of work on ***the Kyoto Protocol***'s

	operational rules and the implementation of the Convention; the deadline for achieving these rules is set for 2000
2000	COP-6 meets at the Hague but negotiations break down
2001	January: the IPCC Third Assessment Report is released March: US President George W Bush announces that the United States will not become a Party to ***the Kyoto Protocol*** July: At the resumed session of COP-6 Parties adopt the 'Bonn Agreements', a political deal on ***the Kyoto Protocol*** rules and the implementation of the Convention November: COP-7 in Marrakesh, Morocco adopts the '***Marrakesh Accords***', a set of detailed rules for ***the Kyoto Protocol*** and the implementation of the Convention
2002	The World Summit on Sustainable Development ("WSSD") meets in Johannesburg, South Africa, to review progress since the 1992 Earth Summit COP-8 in New Delhi, India, seeks to clarify the rules of the regime
2003	At least 55 states ratify ***the Kyoto Protocol***, but the necessary 55% of total carbon dioxide emissions is still to be achieved, so that the Protocol is still not in force

	COP-9 in Milan, Italy, continues to consider the rules of the regime
2004	Russia ratifies ***the Kyoto Protocol***, allowing the Protocol to come into force 16.02.2005 COP-10 in Buenos Aires, Argentina The Convention receives 189 instruments of ratification (August 2005)
2005	***Kyoto Protocol*** enters into force, as of August 2005 there are 155 parties COP-11 and COP-1 of ***the Kyoto Protocol*** take place in Montreal. A Working Group was established to discuss future commitments for developed countries for the period after 2012

(Source: United Nations Education Programme, n.d.)

3.2 United Nations Framework Convention on Climate Change (UNFCCC)

The UNFCCC was created with the main purpose of tackling the negative effects of climate change.[64] ***The UNFCCC*** was negotiated from February 1991 to May 1992. It was opened for signature at the UN Conference on Environment and Development (UNCED) in June 1992. ***The UNFCCC*** was adopted in 1992. It entered into force in 21st March 1994 which was 90 days after the receipt of the ratification of its 50th member. There has been receipt of about 186 instruments of ratification, acceptance, approval or accession up to date from the States.

[64] See note 53 at pg 113

Various meetings of the Conference of the Parties (COP)[65] have taken place since ***the UNFCCC*** came into force. Apart from COP, numerous workshops and meetings of ***the UNFCCC***'s subsidiary bodies like the Subsidiary Body for Implementation (SBI) and the Subsidiary Body for Scientific and Technological Advice (SBSTA) have taken place.

From March 28th to April 7th 1995, the first meeting of the Conference of Parties (COP-1) took place in Berlin, Germany. It was agreed that the permanent secretariat will be situated in Bonn, Germany. The second Conference of Parties (COP-2) took place in Geneva, Switzerland in July 1996. Here, it accepted the scientific findings on climate change submitted by the Intergovernmental Panel on Climate Change (IPCC). It favoured policies which are flexible rather than having uniform "harmonized policies" plus it called for legally binding mid-term targets for States.

The third Conference of Parties (COP-3) took place in Kyoto, Japan from 1-11 December 1997. This conference was attended by more than 10,000 participants who included representatives from governments, NGOs and the press. This conference also included a high-level segment featuring statements from more than 125 ministers. The conclusion of this conference was the adaptation of ***the Kyoto Protocol*** on 11th December 1997.

The fourth Conference of Parties (COP-4) was held in Buenos Aires, Argentina from 2-13 November 1998. This conference was attended by more than 5,000 participants. Here, issues relating to ***the Kyoto Protocol*** were considered. The fifth Conference of the Parties (COP-5) was held in Bonn from 25 October to 5 November 1999 which was

[65] Article 7 of the UNFCCC states" The Conference of the Parties, as the supreme body of this Convention, shall keep under regular review the implementation of the Convention and any related legal instruments that the Conference of the Parties may adopt, and shall make, within its mandate, the decisions necessary to promote the effective implementation of the Convention".

attended by more than 3,000 participants. The delegates continued their work toward fulfilling the Buenos Aires Plan of Action (BAPA). Here, a two-year deadline was set to strengthen ***the UNFCCC*** implementation plus the preparation for the future entry into force of ***the Kyoto Protocol***.

The sixth Conference of the Parties (COP-6) took place in the Hague, Netherlands from the13th to 25th November 2000. COP-6 "bis" negotiations resumed in July 16-27, 2001 in Bonn. This meeting took place after President George Bush said that the U.S. had rejected ***the Kyoto Protocol*** in March 2000. The U.S. felt that by complying with the obligations stated in the ***Protocol***, their economy will be affected financially. Due to this, delegation from the U.S. declined to participate in the negotiations related to the ***Protocol*** and chose to act as observers. The seventh, eighth, ninth, tenth and eleventh Conferences of the Parties were held in Marrakech, New Delhi, Milan, Buenos Aires and Montreal respective from 2001 to 2005. The 12th COP was held in 2006. The thirteenth Conference of the Parties (COP-13) was held in Bali, Indonesia in 2007 which resulted ***in the Bali Roadmap***. The fourteenth Conference of the Parties (COP-14) was held in Poznan, Poland in 2008 which was attended by 187 countries.

3.2.1 Objective of UNFCCC

The objective of ***the UNFCCC*** is stated in Article 2, which states:

> "The ultimate objective of this Convention and any related legal instruments that the Conference of the Parties may adopt is to achieve, in accordance with the relevant provisions of the Convention, stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be achieved within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner. The issue on climate change should be addressed collectively by all countries with individual commitments from individual countries."

3.2.2 Commitments of the Parties

3.2.2.1 General Commitments

Article 4(1) of the UNFCCC states the general commitments which all parties are expected to fulfill. According to this Article:

> "All parties, taking into account their common but differentiated responsibilities and their specific national and regional development priorities, objectives and circumstances".

The meaning of "differentiated responsibilities" is not defined in this convention. However, this goes to show that the commitment required from parties are not the same.

The national programmes and reporting commitment of all parties are stated in ***Article 4(1)(a) and (b)*** of the convention. According to ***Article 4(1) of the UNFCCC***, all parties have to make general commitments regarding:

- The establishment of national inventories of greenhouse gas emissions and sinks;
- The promotion of scientific and technical cooperation;
- The sustainable management of forests, oceans and ecosystems; and
- The integration of climate change considerations in national social, economic and environmental policies.

3.2.2.2 Specific Commitments

Mitigating climate change is the main objective of ***the UNFCCC***. This is to be done by stabilizing the greenhouse gases concentrations in the atmosphere so that the climate will not change. This objective can be achieved by reducing the level of the greenhouse gases in the atmosphere which can be achieved by reducing the emission of the gases from their sources. By increasing the sinks and reservoirs of the greenhouse gases, the concentration of these gases in the atmosphere can be reduced.

In ***Article 1 of the UNFCCC***, the definitions of key words can be found like climate change, climate system, emission, greenhouse gases, sources, sink and reservoir.

"Climate change" is defined as:

> "A change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods".

"Climate system" refers to:

> "The totality of the atmosphere, hydrosphere, biosphere and geosphere and their interactions".

"Emissions" mean:

> "The release of greenhouse gases and/or their precursors into the atmosphere over a specified area and period of time".

"Greenhouse gases" refer to:

> "Those gaseous constituents of the atmosphere, both natural and anthropogenic, that absorb and re-emit infrared radiation".

"Source" refers to:

> "Any process or activity which releases a greenhouse gas, an aerosol or a precursor of a greenhouse gas into the atmosphere".

"Sink" is defined as:

> "Any process, activity or mechanism which removes a greenhouse gas, an aerosol or a precursor of a greenhouse gas from the atmosphere".

Finally, "reservoir" is:

> "A component or components of the climate system where a greenhouse gas or a precursor of a greenhouse gas is stored".

Sinks and reservoirs are stated in ***Article 4.1(d) of the UNFCCC***. It requires the parties to:

> "Promote sustainable management, and promote and cooperate in the conservation and enhancement, as appropriate, of sinks and reservoirs of all greenhouse gases not controlled by the Montreal Protocol, including biomass, forests and oceans as well as other terrestrial, coastal and marine ecosystems."

Article 4.1(f) of the UNFCCC states that the parties should:

> "Take climate change considerations into account, to the extent feasible, in their relevant social, economic and environmental policies and actions, and employ appropriate methods, for example impact assessments, formulated and determined nationally, with a view to minimizing adverse effects on the economy, on public health and on the quality of the environment, of projects or measures undertaken by them to mitigate or adapt to climate change".

Article 4.1(h) of the UNFCCC states that the parties should:

> "Promote and cooperate in the full, open and prompt exchange of relevant scientific, technological, technical, socio-economic and legal information related to the climate system and climate change, and to the economic and social consequences of various response strategies".

Article 4.7 of the UNFCCC states what is required of a developing country. It states that

> "The extent to which developing country Parties will effectively implement their commitments under the Convention will depend on the effective implementation by developed country Parties of their commitments under the Convention related to financial resources and transfer of technology and will take fully into account that economic and social development and poverty eradication are the first and overriding priorities of the developing country Parties".

3.2.2.3 Annex I Parties – Measures to Mitigate

Article 4(2) of the UNFCCC has classified certain countries as Annex I parties who are expected to take on additional commitments.[66] The industrialized nations fall under the Annex I classification and they have committed to return their anthropogenic emissions to 1990 levels by 2000 plus they are required to adopt national policies and measures to

[66] See note 53 at pg 111

mitigate the negative effects of climate change by both limiting the emission of greenhouse gases and by protecting greenhouse gas sinks.[67] According to ***Article 4(2)(a)***:

> "The developed country Parties and other Parties included in Annex I shall adopt national policies and take corresponding measures on the mitigation of climate change, by limiting its anthropogenic emissions of greenhouse gases and protecting and enhancing its greenhouse gas sinks and reservoir. These policies and measures will demonstrate that developed countries are taking the lead in modifying longer-term trends in anthropogenic emissions consistent with the objective of the Convention, recognizing that the return by the end of the present decade to earlier levels of anthropogenic emissions of carbon dioxide and other greenhouse gases".

According to ***Article 4(2)(b)***, the Annex I parties "shall communicate, within six months of the entry into force of the Convention for it and periodically thereafter ... detailed information on its policies and measures" that aim to return their greenhouse gases emission individually or jointly to their 1990 levels by the year 2000. To return the greenhouse gases level to the 1990 levels by 2000 indicates the quantifiable goal here for the Annex I parties to achieve.

However, ***Article 4(2) of the UNFCCC*** is considered to be vague because it did not give a specific figure for the level of greenhouse gases which is required for the Annex I parties to achieve and thus, the extent to which it represents a binding obligation has therefore been questioned.[68]

The UNFCCC is not specific. It is only a framework. It is the basis for future action namely ***the Kyoto Protocol***. The main objective of it is to reduce the greenhouse gas. ***The Kyoto Protocol*** contains further quantification limits for the greenhouse gases

[67] See note 53 at pg 111
[68] See note 53 at pg 111

emission imposed on the Annex I parties. However, a long-term goal for stabilizing these gases at the global level has not been agreed upon.

3.2.2.4 All Parties – Measures to Mitigate

According to ***Article 3.3 of the UNFCC***:

> "The Parties should take precautionary measures to anticipate, prevent or minimize the causes of climate change and mitigate its adverse effects. Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing such measures, taking into account that policies and measures to deal with climate change should be cost-effective so as to ensure global benefits at the lowest possible cost. To achieve this, such policies and measures should take into account different socio-economic contexts, be comprehensive, cover all relevant sources, sinks and reservoirs of greenhouse gases and adaptation, and comprise all economic sectors. Efforts to address climate change may be carried out cooperatively by interested Parties".

According to ***the UNFCCC***, in order to reduce climate change, the responsibilities of the parties are differentiated which is based on the needs and capabilities of the parties.

According to ***Article 4.1 of the UNFCCC***:

> "All Parties, taking into account their common but differentiated responsibilities and their specific national and regional development priorities, objectives and circumstances". This is further echoed in ***Article 4.2(a)*** which states "taking into account the differences in these Parties' starting points and approaches, economic structures and resource bases, the need to maintain strong and sustainable economic growth, available technologies and other individual circumstances".

3.2.2.5 Financial Assistance and Technology Transfer

The issue on financial assistance is stated in ***Article 3 of the UNFCCC***, which states:

> "the developed country Parties and other developed Parties included in Annex II shall provide new and additional financial resources to meet the agreed full costs incurred by developing country Parties in complying with their obligations under ***Article 12, paragraph 1***. They shall also provide such financial resources, including for the transfer of technology, needed by the developing country Parties to meet the agreed full incremental costs of implementing measures that are covered by ***paragraph 1*** of this Article and that are agreed between a developing country Party and the international entity or entities referred to in ***Article 11***, in accordance with that Article. The implementation of these commitments shall take into

account the need for adequacy and predictability in the flow of funds and the importance of appropriate burden sharing among the developed country Parties".

Annex II parties are defined as:

> "Annex II parties are the OECD members of Annex I, but not the economies in transition (EIT) Parties. They are required to provide financial resources to enable developing countries to undertake emissions reduction activities under the Convention and to help them adapt to adverse effects of climate change. In addition, they have to "take all practicable steps" to promote the development and transfer of environmentally friendly technologies to EIT Parties and developing countries. Funding provided by Annex II Parties is channeled mostly through the Convention's financial mechanism."[69]

EIT parties are the group of countries with economies in transition.

Based on ***Article 3*** above, it can be seen that the Annex II parties must finance the agreed full costs that the developing parties incur in preparing the national reports as stated in ***Article 1 of the UNFCCC***. Apart from this, the Annex II parties must pay the agreed full incremental costs to the developing countries for implementing measures stated in ***Article 4.1 of UNFCCC***. Furthermore, Annex II parties in implementing ***Article 4.3***, they must ensure that there is adequate and predictable flow of funds and appropriate burden sharing among the developed country Parties. The least developed countries that are very vulnerable to the adverse effects of climate change must not be forgotten. Thus, the Annex II countries are required to take full account of the least developed countries' needs and special situations in meeting the costs of adaptation to the change of climate.

In relation to transfer of technology, ***Article 4.5 of the UNFCCC*** states:

> "The developed country Parties and other developed Parties included in Annex II shall take all practicable steps to promote, facilitate and finance, as appropriate, the transfer of, or access to, environmentally sound technologies and know-how to other Parties, particularly developing country Parties, to enable them to implement the provisions of the Convention. In this process, the developed country Parties shall support

[69] United Nations, UNFCCC, *Parties and Observers*, 7 March 2009 http://unfccc.int/parties_and_observers/items/2704.php

> the development and enhancement of endogenous capacities and technologies of developing country Parties. Other Parties and organizations in a position to do so may also assist in facilitating the transfer of such technologies".

Based on this article, it can be seen that Annex II parties must take all practise steps to promote, facilitate and finance as appropriate the transfer of or access to environmentally sound technologies and know-how to developing country parties. Annex II parties must support the development and enhancement of endogenous capacities and technologies of developing country parties.

3.2.3 Legal Principles

The UNFCCC is only a framework and a guide to the parties. It does not impose any legally binding obligations on the parties. The principles of ***the UNFCC*** are stated in ***Article 3*** where it is stated that these principles are guides. According to ***Article 3.1 of the UNFCCC***:

> "The Parties should protect the climate system for the benefit of present and future generations of humankind, on the basis of equity and in accordance with their common but differentiated responsibilities and respective capabilities".

Article 3.1 states the need to protect the climate system for the benefit of the present and future generations on the basis of equity. ***Article 3.1*** also states the responsibilities of the parties shall be common but differentiated. This means that since the level of emission of the greenhouse gases are distributed unevenly among the parties plus their capacities and resources to address this issue are also different, their respective responsibilities to address this issue are differentiated. As such, based on ***Article 3.1***:

> "The developed country parties should take the lead in combating climate change and the adverse effects thereof".

That is the reason why the responsibilities of Annex I parties and non-Annex I parties are different. Even within Annex I, parties who are listed in Annex II are required to provide

financial assistance and facilitate the transfer of technologies to developing nations in order to help them implement their respective commitments under ***the UNFCCC***. EIT group are given some degree of flexibility in implementing their commitments.

Article 3.3 of the UNFCCC mentions the precautionary principle. According to it:

> "The Parties should take precautionary measures to anticipate, prevent or minimize the causes of climate change and mitigate its adverse effects. Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing such measures, taking into account that policies and measures to deal with climate change should be cost-effective so as to ensure global benefits at the lowest possible cost. To achieve this, such policies and measures should take into account different socio-economic contexts, be comprehensive, cover all relevant sources, sinks and reservoirs of greenhouse gases and adaptation, and comprise all economic sectors. Efforts to address climate change may be carried out cooperatively by interested Parties."

It is stated here that the policies and measures undertaken to deal with climate change must be cost-effective. However, this is very vague because there is no indication about what types of costs may be considered.

Article 3.4 of the UNFCCC which is in line with ***Principle 3 the Rio Declaration*** states the right of the parties to promote sustainable development. According to ***Article 3.4***:

> "The Parties have a right to, and should, promote sustainable development. Policies and measures to protect the climate system against human-induced change should be appropriate for the specific conditions of each Party and should be integrated with national development programmes, taking into account that economic development is essential for adopting measures to address climate change."

Principle 3 of the Rio Declaration on Environment and Development states "the right of development must be fulfilled so as to equitably meet developmental and environmental needs of present and future generations."

3.2.4 Institutional Mechanisms

Article 7.1 of the UNFCCC established the Conference of the Parties (COP). ***Article 7.2 of the UNFCCC*** states:

> "The Conference of the Parties, as the supreme body of this Convention, shall keep under regular review the implementation of the Convention and any related legal instruments that the Conference of the Parties may adopt, and shall make, within its mandate, the decisions necessary to promote the effective implementation of the Convention".

In other words, COP is the governing body of ***the UNFCCC*** which comprises of all parties. The review of the operation and implementation of ***the UNFCCC*** is done by the COP. The adaptation of protocols and other related legal instruments is considered here.

Article 8.1 of the UNFCCC states that "a secretariat is hereby established". The functions of the secretariat is stated in ***Article 8.2*** which include arranging meetings of the COP, assisting the parties in the development of reports and ensuring the necessary coordination with the secretariats of other relevant international bodies is consistent.

Article 9 of the UNFCCC established the subsidiary body for scientific and technical advice. According to ***Article 9.1***, the purpose of this body is:

> "To provide the Conference of the Parties and, as appropriate, its other subsidiary bodies with timely information and advice on scientific and technological matters relating to the Convention".

Article 9.1 also stated that:

> "This body shall be open to participation by all Parties and shall be multidisciplinary. It shall comprise government representatives competent in the relevant field of expertise. It shall report regularly to the Conference of the Parties on all aspects of its work".

Article 10.1 of the UNFCCC formed a subsidiary body for implementation to assist the COP in the assessment and review of the effective implementation of the Convention.

This body comprises government representatives who are experts on matters related to climate change. It is open to participation by all parties. According to ***Article 10.2:***

> "Under the guidance of the Conference of the Parties, this body shall:
> (a) Consider the information communicated in accordance with ***Article 12, paragraph 1***, to assess the overall aggregated effect of the steps taken by the Parties in the light of the latest scientific assessments concerning climate change;
> (b) Consider the information communicated in accordance with ***Article 12, paragraph 2***, in order to assist the Conference of the Parties in carrying out the reviews required by ***Article 4, paragraph 2 (d)***; and
> (c) Assist the Conference of the Parties, as appropriate, in the preparation and implementation of its decisions."

3.2.5 Dispute Resolution

Article 14 of the UNFCCC talks about dispute resolution arising from two or more parties. It states:

> "In the event of a dispute between any two or more Parties concerning the interpretation or application of the Convention, the Parties concerned shall seek a settlement of the dispute through negotiation or any other peaceful means of their own choice".

To resolve any dispute, two options are given by ***Article 14.2*** which are: -

1. Submission of the dispute to the International Court of Justice; and/or
2. Arbitration in accordance with procedures to be adopted by the COP as soon as practicable, in an annex on arbitration.

3.3 Kyoto Protocol

The Kyoto Protocol, which was established by ***the UNFCCC***, came about in 1997 with the main purpose to consider what can be done to reduce Global warming. This treaty involves most world countries with the exception of the United States of America. It opened for signature on March 16, 1998 and closed on March 15, 1999. This agreement came into force on 16 February 2005 after Russia ratified it on 18 November 2004. Around 169 countries and other governmental entities have ratified it as of December 2006. This represents about 61.6% of emissions from Annex 1 countries.

3.3.1 Classification of Members

Similar to ***the UNFCCC***, ***the Kyoto Protocol*** has also divided the state parties into three categories based on their rights and obligations, namely: -

1. Annex I Parties

   Consist of developed industralised nations. According to ***Article 3(1) of the Kyoto Protocol***:

   > "The Parties included in Annex I shall, individually or jointly, ensure that their aggregate anthropogenic carbon dioxide equivalent emissions of the greenhouse gases listed in Annex A do not exceed their assigned amounts, calculated pursuant to their quantified emission limitation and reduction commitments inscribed in Annex B and in accordance with the provisions of this Article, with a view to reducing their overall emissions of such gases by at least 5 per cent below 1990 levels in the commitment period 2008 to 2012".

2. Annex II Parties

   Annex II parties are:

   > "The OECD members of Annex I, but not the EIT Parties. They are required to provide financial resources to enable developing countries to undertake emissions reduction activities under the Convention and to help them adapt to adverse effects of climate change. In addition, they have to "take all practicable steps" to promote the development and transfer of environmentally friendly technologies to EIT Parties and developing countries. Funding provided by Annex II Parties is channeled mostly through the Convention's financial mechanism."[70]

3. Non-Annex I Parties

   These are developing countries.

3.3.2 Main Features

In order to achieve ***the UNFCCC***, a legally binding commitment has been agreed to by the parties to ***the Protocol***. The Annex I parties have committed to reduce their overall emissions of the greenhouse gases listed in Annex A of the Protocol by at least 5 per cent below 1990 levels in the commitment period 2008 to 2012. According to ***Article 3 of the***

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[70] See note 69

Protocol, the base year of 1990 applies to carbon dioxide, methane and nitrous dioxide. As for the rest, ***Article 3(8) of the Protocol*** states:

> "...may use 1995 as its base year for hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride, for the purposes of the calculation".

In relation to the non-Annex I parties, no quantifiable commitment has been set which is based on the principle of common but differentiable responsibility. The principle of sustainable development is mentioned in ***Articles 2, 10 and 12 of the Protocol.*** According to ***Article 10***:

> "all Parties, taking into account their common but differentiated responsibilities and their specific national and regional development priorities, objectives and circumstances, without introducing any new commitments for Parties not included in Annex I, but reaffirming existing commitments under ***Article 4, paragraph 1***, of the Convention, and continuing to advance the implementation of these commitments in order to achieve sustainable development...".

Thus, non-Annex II parties are only expected to implement their commitments by taking into account their common but differentiated responsibilities and their specific national and regional development priorities, objectives and circumstances in order to achieve sustainable development.

The Kyoto Protocol also introduced flexible mechanisms which are market-based mechanisms meant to help developed countries achieve their emission reduction targets. The flexible mechanisms are Emission Trading (ET), Joint Implementation (JI) and Clean Development Mechanism (CDM).

Article 3 and ***Article 4 of the Protocol*** allow Annex I parties to have joint agreement in order to achieve their emission targets.

Article 5(1) of the Protocol requires the Annex I parties to establish a national system. According to it, "each Party included in Annex I shall have in place, no later than one year prior to the start of the first commitment period, a national system for the estimation of anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by ***the Montreal Protocol***".

Article 7 of the Protocol requires the Annex I parties to annually submit information relating to its annual inventory of anthropogenic emissions by sources and removal by sinks of the greenhouse gases. It states:

> "Each Party included in Annex I shall incorporate in its annual inventory of anthropogenic emissions by sources and removals by sinks of greenhouse gases not controlled by the Montreal Protocol, submitted in accordance with the relevant decisions of the Conference of the Parties, the necessary supplementary information for the purposes of ensuring compliance with ***Article 3***...".

Issues relating to the review of this information are stated in ***Article 8 of the Protocol*** which will be done by experts who are coordinated by the Secretariat.

The Protocol shall be reviewed by the COP periodically based on the best available scientific information and assessment of the climate change (***Article 9 of the Protocol***).

Article 11 of the Protocol states the financial resources to be provided by Annex I parties to the non-Annex I parties in order for the non-Annex I parties to meet the agreed full cost incurred in implementing their commitments under the Protocol and also to meet the agreed full incremental costs incurred in the implementation of their commitments under the Protocol.

Article 15 of the Protocol states "the Subsidiary Body for Scientific and Technological Advice and the Subsidiary Body for Implementation established by ***Articles 9 and 10 of***

the Convention shall serve as, respectively, the Subsidiary Body for Scientific and Technological Advice and the Subsidiary Body for Implementation of this Protocol".

3.3.3 Flexible Mechanisms

These are mainly designed to minimise the cost incurred by the developed nations reducing the greenhouse gases emission. There are three namely Joint Implementation (JI), Emissions Trading (ER) and Clean Development Mechanisms (CDM).

3.3.3.1 Joint Implementation (JI)

According to ***Article 6 of the Protocol***:

> "Any Party included in Annex I may transfer to, or acquire from, any other such Party emission reduction units resulting from projects aimed at reducing anthropogenic emissions by sources or enhancing anthropogenic removals by sinks of greenhouse gases".

This allows Annex I parties to achieve their targets in the reduction of emission of the greenhouse gases by doing joint projects with another Annex I party. This is a good mechanism because it allows two countries to help each other in order to achieve their respective targets in the ***Protocol***.

3.3.3.2 Emission Trading (ET)

According to ***Article 17 of the Protocol***:

> "The Parties included in Annex B may participate in emissions trading for the purposes of fulfilling their commitments under ***Article 3***. Any such trading shall be supplemental to domestic actions for the purpose of meeting quantified emission limitation and reduction commitments under that ***Article***".

In order to assist one Annex I party to achieve its emission targets, another Annex I party may transfer part of its assigned amount to it. ET can only be done by Annex I parties.

This is a good mechanism because it allows two countries to help each other in order to achieve their respective targets in the ***Protocol***.

3.3.3.3 Clean Development Mechanism (CDM)

This is stated in ***Article 12 of the Protocol***. It states:

> "The purpose of the clean development mechanism shall be to assist Parties not included in Annex I in achieving sustainable development and in contributing to the ultimate objective of the Convention, and to assist Parties included in Annex I in achieving compliance with their quantified emission limitation and reduction commitments under ***Article 3***".

It is similar to JI. However, the CDM allows industralised countries with emission reduction commitments to meet part of their commitments by investing in projects in developing countries to reduce the greenhouse gases emissions.[71] The industralised nations can use the CDM to meet their emissions targets by earning 'credits' for their contribution to achieving emissions reductions in developing countries.[72] There are many benefits which developing countries can enjoy from this, namely, these activities that reduce the combustion of fossil fuels (coal, oil, gas, kerosene) or reduce methane emissions (from landfill sites, for example) or improve land-use patterns (such as reforestation) will be able to attract additional investment.[73] There are two requirements of a CDM project, namely: -

- It has to meet certain measurable environmental criteria, and
- It has to fit in with the host country's development priorities.[74]

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[71] Malaysia, Pusat Tenaga Malaysia, *Malaysia CDM Information Handbook*, (Seri Kembangan: Pusat Tenaga Malaysia, 2006) at pg 3.
[72] See note 71 at pg 3
[73] See note 71 at pg 3
[74] See note 71 at pg 3

There also other benefits which the developing country will enjoy from this project, namely: -

- Positive environmental improvements like reduced air and water pollution and less land degradation, and
- Social improvements like creation of new jobs.[75]

There were two project-based mechanisms introduced by ***the Kyoto Protocol*** for the international mitigation efforts, namely the CDM, between an industralised and a developing country, and Joint Implementation (JI), between two industralised[76] countries.[77]

A CDM project is a market force driven development project that reduces the greenhouse gases.[78] The implementation of the CDM takes place the following way. Firstly, an emitter in the industralised country calculates the cost of making the target set by its own government which it can achieve through its own internal actions.[79] Alternatively, a cheaper reduction could be achieved if it chooses a lower cost option by pursuing projects in a developing country.[80] Here, the investor from an industralised country supplies capital or technology based on the future value of certified emissions reduction units (CERs) also known as carbon credits.[81] These carbon credits are a measure of the reduction of the greenhouse gases achieved by the project in the non-Annex I country (developing nation).[82] Thus, the CDM which combines the interest of both the Annex 1 and non-Annex 1 countries, can be seen a trade opportunity for a developed country to

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[75] See note 71 at pg 3
[76] In this context 'industralised' or Annex I countries include the countries of Eastern Europe and the former Soviet Union
[77] See note 71 at pg 5
[78] See note 71 at pg 5
[79] See note71 at pg 5
[80] See note 71 at pg 3
[81] See note 71 at pg 3
[82] See note 71 at pg 3

work with a developing country to develop not only new technologies and industries but also assist in creating cleaner economies.[83] The CDM has two goals, namely to assist developing countries who host CDM projects to achieve sustainable development and to provide developed countries with flexibility for achieving their emission reduction targets, by allowing them to take credits from emission reducing projects undertaken in developing countries.[84] For a project to qualify for generating the tradable CERs, the project must generate sustainable development benefits for the host country as a whole.[85] The Annex 1 country can use CERs to contribute to compliance of their quantified greenhouse gases reduction targets of the Kyoto Protocol.[86]

Table 3.2: CDM Projects and CERs

	Annual Average CERs*	Expected CERs until end of 2012**
CDM project pipeline: > 4200 of which:	N/A	> 2,900,000,000
--- 1403 are registered	260,554,968	> 1,450,000,000
--- 69 are requesting registration	5,642,023	> 20,000,000

(Source: http://unfccc.int/)

* Assumption: All activities deliver simultaneously their expected annual average emission reduction

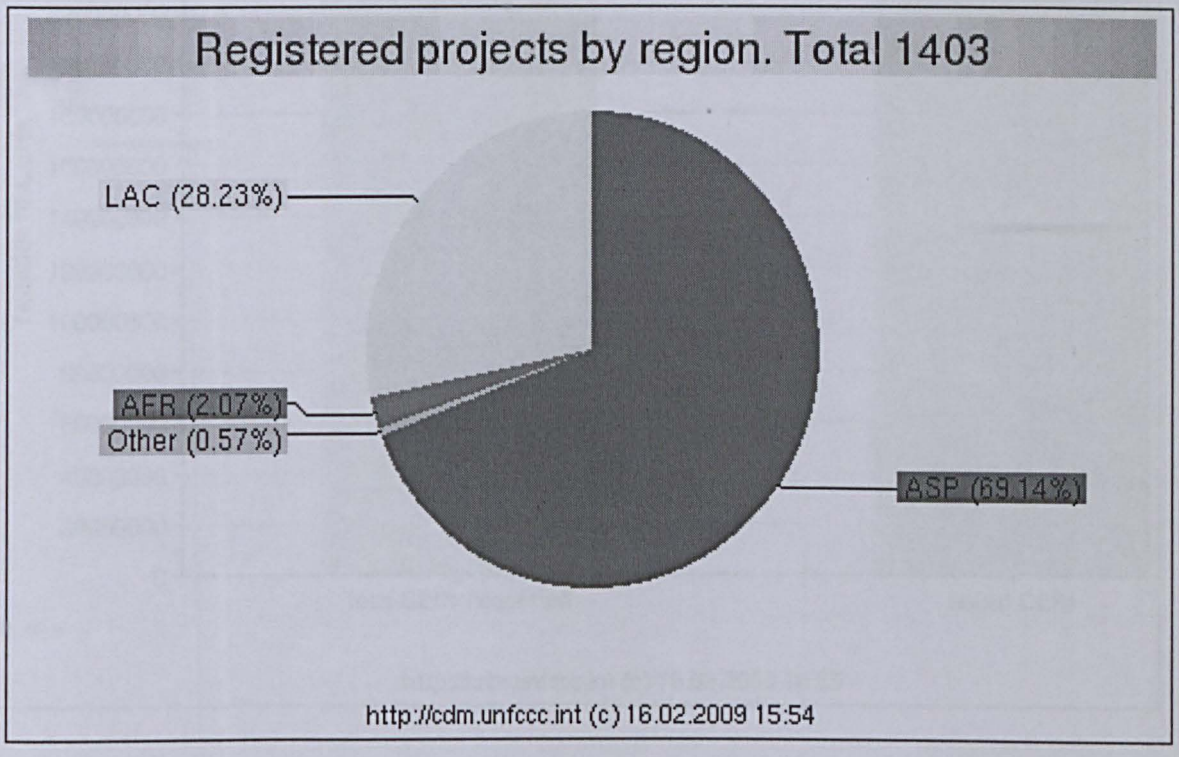
** Assumption: No renewal of crediting periods

[83]See note 71 at pg 6
[84]See note 71 at pg 6
[85]See note 71 at pg 7
[86]See note 71 at pg 7

Table 3.3: Region and number of CDM projects

Region	Number of projects
Africa (AFR)	29
Asia and the Pacific (ASP)	970
Other	8
Latin America and the Caribbean (LAC)	396

(Source: http://unfccc.int/)



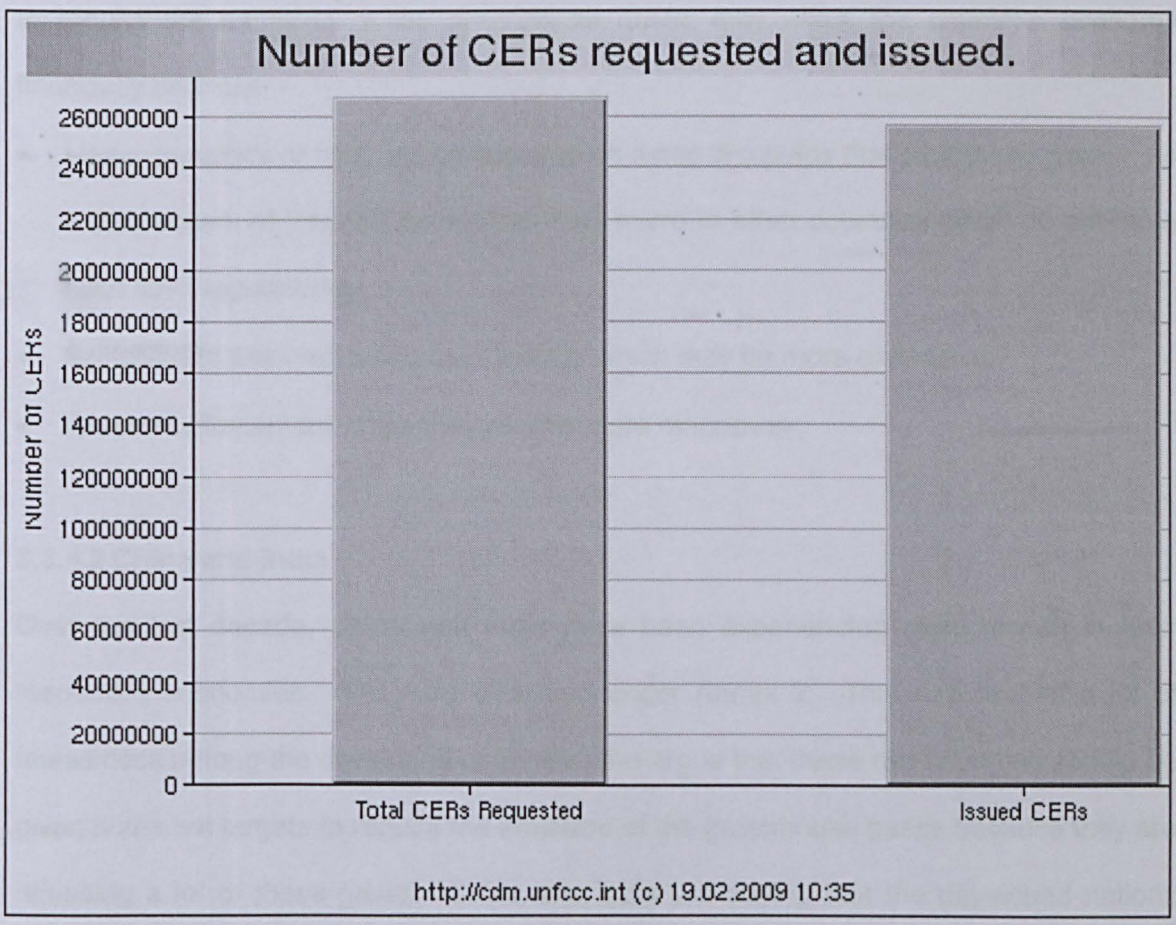
(Source: http://unfccc.int/)

Figure 3.1: Registered projects by region

Table 3.4: Number of CERs

Title	Number of CERs
Issued CERs	256,825,317
Total CERs Requested	267,748,486

(Source: http://unfccc.int/)



(Source: http://unfccc.int/)

Figure 3.2: Number of CERs requested and issued

3.3.4 Obstacles

3.3.4.1 Developed Nations

The developed nations consist of all European countries and the U.S. However, the U.S. being the largest emitter of the greenhouse gases have not ratified the protocol. All except Germany have not fulfilled their obligations i.e. to reduce the Greenhouse emission. So far, they have not taken any action. Where Germany is concerned, they have achieved their goal with a lesser cost. However, other countries fear that they cannot achieve without having a negative impact on their economy. The measures taken to reduce the emission of the greenhouse gases may affect the country's economy financially because: -

- Heavy penalties or fines will be imposed on those industries that emit these gases. As a consequent of this, the companies may move to other countries which do not have such strict regulations;
- Switching to alternative source of energy which may be more expensive;
- Greater enforcement which may require more manpower.

3.3.4.2 China and India

Over the last decade, China and India have been experiencing rapid growth in their respective economies. They are classified under Annex 2. This has caused a lot of uneasiness among the developed countries who argue that these two countries should be given some set targets to reduce the emission of the greenhouse gases because they are releasing a lot of these gases. China and India are saying that the developed nations have already done a lot of damage. As for China and India only now they are achieving growth in their economy and the developed nations are attacking them. This is considered to be unfair because the responsibility of the climate belongs to all countries.

3.3.4.3 Developing Countries

As far as the developing countries are concerned, ***the Kyoto Protocol*** states that they should be given financial and technical assistance in order to improve their economy while improving their obligation by developed countries. This is because their carbon emission is very low compared to the developed nations, e.g. Africa only emits 5% of the greenhouse gases which is equivalent to one state in the US.

3.4 Bonn Conference

In May 2006, the Bonn Conference took place where delegates from 165 countries met with the main purpose to discuss how to further strengthen international cooperation to reduce emissions of heat-trapping gases and to respond to climate change impacts.[87] In this conference, a lot of emphasis was put on the promotion of economic incentives to promote action to reduce emissions - for both industrialized and developing countries.[88] A lot of discussion was done on the possible approaches including incentives for developing countries to mitigate climate change, ensuring cooperation on research and development and the transfer of cleaner technologies.[89] Here, the delegates expressed strong support for the role of the carbon market and the need to find new ways to involve the private sector in climate protection.[90] Other issues highlighted included those problems faced by less industrialised countries who also face problems related to climate change.[91] Talks on Climate Change between the 165 countries involved are set to continue until at least 2012 when the first commitment period of ***the Kyoto Protocol*** ends.[92]

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[87] "Climate Change from the BBC Weather Centre", *BBC*, n.d., 8 January 2009 http://www.bbc.co.uk/climate/policies/

[88] See note 87

[89] See note 87

[90] See note 87

[91] See note 87

[92] See note 87

3.5 Bali Roadmap

This took place at the 13th session of the COP at the Bali International Convention Centre, Indonesia. It is known as ***the Bali Action Plan***. More than 10,000 participants over 180 countries attended this session. This conference adopted ***the Bali Roadmap*** which includes ***the Bali Action Plan***. A shared vision for a long term cooperation action was decided based on the principle of common but differentiated responsibilities and the parties' respective capabilities. This was in terms of a long term global emission reduction goal. It was also decided that there should be a national appropriate mitigation action undertaken by the developing nations. This should be done in the context of sustainable development in order to reduce emissions. There was also decision made in terms of adaptation which should be achieved through international cooperation. Again the issue on technology transfer and development in order to support action on mitigation and adaptation was also decided. Financial resources and investment to support resources and investment to support actions on mitigation and adaptation and technology cooperation was also adapted as part of ***the Bali Action Plan***.

3.5.1 Criticisms of the Bali Roadmap

There was no concrete outcome in this session. The parties said that there is still room for future negotiation. The initial target set in ***the Kyoto Protocol*** has not even been achieved yet in terms of reducing the greenhouse gases emission but the parties just cannot stop discussing and start putting their words into action. The developed countries want further discussion before their start implementing their commitments but the developing countries say that there should be no more discussion. This is lead by China, India and South Africa. Developed nations have a problem with China and India because they claim that these two nations are contributing a lot to the greenhouse gases emission. The developed nations want these two countries to increase their commitments.

3.6 COP-14

This was held in Poznan, Poland in December 2008 where 187 countries attended the conference. The aim was to begin the process of negotiations aimed at achieving agreement on a new set of emission targets beyond 2012 before December 2009 COP-15 in Denmark.

The developed nations were called upon by the European Union to reduce their emissions by 30% below 1990 level by 2020. Even the developing nations were called upon by the European Union to reduce theirs 15% - 30% below business as usual. There was a call by the developing nations that there needs to be a stronger support from the developed nations in areas of finance and technology. They also said that the global economy crisis should not be seen as a hindrance but an opportunity to advance efforts to address the issue on climate change.

There was also a suggestion there needs to be a new instrument with legally binding elements alongside ***the Kyoto Protocol***. However, there was objection from most of the non-Annex I parties especially China and India. Again this conference was concluded with modest conclusions and a poor participation of the U.S.

3.7 Criticisms of the Current Initiatives

The current initiatives taken in relation to climate change has failed to persuade the U.S. which is the main contributor to this Climate change to take any counter measures to reduce the greenhouse gas emission. A lot of meetings have taken place since ***the UNFCCC*** and ***the Kyoto Protocol*** but they did not end in way which would compel members especially those from the developed nations to taken measures to reduce the greenhouse gases. Based on the current situation, ***the Kyoto Protocol*** can be seen as a "useless document" because it has failed to get the commitment of the developed nations.

Since 1994 until today, negotiations are still going on. There have been calls for a review of the existing commitments.

There is still a split in the world community about the basic structure of ***the Kyoto protocol***. This was apparent in Bali. On one hand, EU and most of the developing nations are in favour of the current protocol. However, the U.S., Japan and Canada want the current protocol to be changed.

The poor response from COP-14 was also attributed to the global economic uncertainty. There was lack of progress seen in this conference as indicated by the lack of commitment from the developed countries. ***The Bali Action Plan*** was suppose to engage the U.S. and the major emerging economies to take commitment on emission but it failed.

The U.S. is not willing to agree to anything unless there is greater commitment from China, India and other major emerging economies. These countries on the other hand want the Annex I parties to fulfill their commitments first.

Conclusion

Despite there being ***the UNFCCC*** and ***the Kyoto Protocol*** together with 14 COPs, there is still little progress made in the global effort to reduce the emission of the greenhouse gases. The change of administration in the U.S. is hoped to change to the U.S. lack of participation in any global effort to combat the change of climate.

CHAPTER FOUR: MALAYSIAN OBLIGATIONS AND INITIATIVES

Introduction

The UNFCCC was ratified in 1994. As part of the obligation under ***the UNFCCC***, Malaysia submitted its Initial National Communication (INC) in 2000 with the support from UNDP/GEF. In order to generate a comprehensive report on climate change related issues in Malaysia, the Second National Communication (NC2) is being prepared as a continual step towards further implementation of ***the UNFCCC*** at national level. As a developing country, Malaysia has no serious obligations under ***the UNFCCC*** and ***the Kyoto Protocol***. Malaysia has taken some initiatives so far pertaining to the problem of climate change and global warming.

4.1 Malaysia's Obligations

Malaysia has no serious obligations under ***the UNFCCC*** and ***the Kyoto Protocol***. As a developing country, Malaysia's only real obligation is to report. Malaysia also has a general obligation to reduce greenhouse gases and increase carbon sink. However, there are no set targets given to Malaysia and other developing nations on this matter.

Malaysia's obligations under ***the UNFCCC*** are as follows:

- Prepare inventories of greenhouse gas (GHG) emissions and sources for reporting to ***the UNFCCC***;
- Formulate programmes containing measures to mitigate climate change and promote sustainable development;
- Prepare and develop plans for adaptation to impacts of climate change; and
- Promote research, cooperation, information, training and awareness activities.[93]

[93] Conservation and Environmental Management Division, home page, Ministry of Natural Resources and Environment, 24 Feb. 2009 < http://nc2.nre.gov.my/>.

As part of its obligation under ***the UNFCCC***, Malaysia, through the Ministry of Science, Technology and Environment (MOSTE), submitted to ***the UNFCCC*** Secretariat in July 2000 the Initial National Communication (INC) which comprised of National Inventory, impacts of climate change on the nation, and programmes of relevance to climate change.[94] The preparation of the INC was conducted with the support of GEF's fund, through UNDP as the implementing agency.[95]

As a continual step towards further implementation of ***the UNFCCC*** at the national level and in compliance with ***Article 12 of the Convention***, the Second National Communication (NC2) is being prepared with the main objective of preparing a comprehensive report on the climate change related issues.[96] A viable institutional and procedural framework through the NC2 will be established to ensure continuous reporting of national communications to ***the UNFCCC***.[97] The analysis conducted within the INC will be upgraded and extended, which will result in preparation of an advanced national report in the form of NC2.[98] The preparation of the NC2 will further ensure that climate change issues are integrated into national and local strategic planning processes.[99]

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[94] See note 93
[95] See note 93
[96] See note 93
[97] See note 93
[98] See note 93
[99] See note 93

The important milestones achieved by Malaysia in relation to the climate change is shown below[100]: -

Table 4.1: Milestones achieved by Malaysia in relation to the climate change

Year	Milestones achieved
1972	Participation at the first Earth Summit held in Stockholm.
1989	Malaysia ratifies the Montreal Protocol on Substances that Deplete the Ozone Layer.
1992	Participation at the second Earth Summit held in Rio de Janeiro, where ***the United Nations Framework Convention on Climate Change (UNFCCC)*** was adopted at the Rio Convention. Following this, calls were made for a stabilization of GHG emission by 2000.
1994	UNFCCC entered into force. Malaysia ratified ***the UNFCCC*** in this year.
1995	Berlin – Malaysia set up the National Climate Committee.
2000	Malaysia submitted the Initial National Communication (INC) to ***the UNFCCC***, where impacts on several sectors as well as identification of possible mitigation measures.
2002	Malaysia ratified ***the Kyoto Protocol***.
2005	***The Kyoto Protocol*** entered into force.

(Source: Initial National Communication, 2000)

[100] Cheryl Rita Kaur, "Addressing Global Warming in Malaysia", *IMPAK*, 2008, 2

4.2 Malaysia's Scorecard

Malaysia has adopted a "precautionary principle" and "no regret" policy, that action, justified in their right, could be taken to mitigate or adapt to climate change, even though there are still scientific uncertainties.[101] The framework is sustainable developments goals which are embodied in the Third Malaysian Plan (1976 – 1980).[102] A National Climate Committee was formed in January 1995 and chaired by the Secretary-General of the then Ministry of Science, Technology and the Environment, now the Ministry of Natural Resources and Environment.[103] This committee consists of at least ten Government Ministers, agencies and stakeholders from the business and civil society groups.

In order to address the climate change issue, Malaysia has adopted the following strategies[104]: -

- Identifying the energy sector as a major contribution of the greenhouse gases to the atmosphere. To reduce the heavy dependence on oil, the Government has identified hydro power and gas, besides oil and coal, as the primary sources to meet increasing energy demands;
- Promotion of energy efficiency among industries, buildings and the transport sector;
- Implementation of public awareness programme by government agencies and non-government organizations to promote energy efficiency, recycling and use of public transport;
- Maintenance of an effective forest management and conservation programme to preserve biodiversity and sinks for the greenhouse gases;
- Ensuring food sufficiency by obtaining detailed information on the supply and demand gaps from food production and supported by research projects;

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[101] Malaysia, Conservation and Environmental Management Division (CEMD), Ministry of Natural Resources and Environment, *Climate Change in Malaysia*, (Putrajaya: CEMD, 2005) at pg 14.
[102] See note 101 at pg 14
[103] See note 101 at pg 14
[104] See note 101 at pg 14

- Undertaking a coastal vulnerability index study (CVI) that could serve as a basis for recommending proactive adaptive measures to mitigate the impact of sea level rise.

However, currently the climate change problem has not been taken seriously by the Government.[105] The Cabinet Committee on Climate Change which is chaired by the Prime Minister and consists of cabinet ministers has not even met once.[106] Furthermore, there is no Non-Government Organization (NGO) representation there. The National Climate Change Committee has not been meeting regularly lately and it focuses only on CDM.[107]

4.3 Rules and Regulations

The environment-related policies in Malaysia are as follows: -

- National Forestry Policy 1978
- National Energy Policy 1979
- National Policy on Biological Diversity 1998
- National Policy on the Environment 2002
- Third National Agricultural Policy 1998-2010

The purpose of these policies is to enhance environmental awareness. However, at the moment there is no national policy which focuses solely on climate change.[108]

In the 2008 Budget, several tax incentives were given for energy conservation and energy saving initiatives for company use. The purpose is to promote energy efficiency and the

[105] Interview with Gurmit Singh, Environmental Protection Society Malaysia, Personal Interview on 17 March 2009.
[106] See note 105
[107] See note 105
[108] See note 105

use of renewable energy. Under ***the Kyoto Protocol***, companies will be given a certificate of Certified Emission Reduction (CER) if they have succeeded in reducing the emission of the greenhouse gases. This CER can be traded and the income derived here are given tax exemption.

The laws related to climate change are as follows in Malaysia: -

- ***Environment Quality Act 1974***
    - ***EQ (Clean Air) Regulation 1978***
    - ***EQ (Prescribed Activities) (EIA) Order 1987***
- ***National Forestry Act 1984***
- ***Fisheries Act 1985***
    - ***Fisheries Maritime Regulations 1967 (Amended 1987)***
    - ***Fisheries (Marine Culture System) Regulation***
- ***Town and Country Planning Act 1976***
- ***Petroleum Mining Act 1986 (Rev. 1972)***
- ***Petroleum Development Act 1974***
- ***Land Conservation Act 1960***
- ***National Parks Act 1980***

Certain issues relating to the climate change can be found in the Malaysian National Policy on the Environment, i.e. the National Policy on the Environment 2002. This policy integrates the three elements of sustainable development: economic, social and cultural development and environmental conservation.[109] It was formulated and approved in 2002. This Policy aims at continued economic, social and cultural progress and enhancement of the quality of life of Malaysians through environmentally sound and sustainable

[109] "The National Policy On The Environment", *Department of Environment, Malaysia*, n.d., 18 February 2009 http://www.doe.gov.my/en/content/national-policy-environment.

development.[110] It is based on eight (8) inter-related and mutually supporting principles set to harmonise economic development goals with environmental imperatives[111]:

- Stewardship of the Environment
- Conservation of Nature's Vitality and Diversity
- Continuous Improvement in the Quality of the Environment
- Sustainable Use of Natural Resources
- Integrated Decision-Making
- Role of the Private Sector
- Commitment and Accountability
- Active Participation in the International Community

The National policy on the Environment serves as an important guide to all stakeholders to ensure that the environment is clean, safe, healthy and productive.[112]

It has been argued that this policy is "all words but no action".

4.4 Environmental Management

At the federal level, the management of the environment falls under the purview of the Department of Environment (DOE) of the Ministry of Science, Technology and Environment. Matters involving the pollution of air, water, land, sea and marine are dealt with by the DOE. At the federal level, issues pertaining to climate change come under the purview of the Conservative and Environmental Management Division (CEMD) of the Ministry of Natural Resources and Environment.

The Environmental Quality Act 1974 (EQA) is the main legislation governing the issues of pollution. ***EQA*** is the parent Act for environmental pollution related issues in Malaysia.

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[110] See note 109
[111] See note 109
[112] See note 109

However, it is only a framework which requires subsequent regulations to address specific environmental issues. Currently, there are about 33 ***Environmental Quality Regulations***.

Section 2 of EQA defines 'pollution' as:

> "any direct or indirect alteration of the physical, thermal, chemical or biological properties of any part of the environment by discharging, emitting or depositing environmentally hazardous substances, pollutants or wastes so as to affect any beneficial use adversely, to cause a condition which is hazardous or potentially hazardous to public health, safety, or welfare, or to animals, birds, wildlife, fish or aquatic life, or to plants or to cause a contravention of any condition, limitation or restriction to which a licence under this Act is subject."

Under ***the EQA***, the terms 'pollutants' and 'waste' include gas emitted into the atmosphere. 'Waste' is defined in ***section 2 EQA*** as:

> "any matter ... or in the form of gas or vapour which is emitted, discharged or deposited in the environment ... as to cause pollution." 'Pollutants' under ***section 2 of the EQA*** refers to "any natural or artificial substances, ... or in the form of gas or vapour, or in a mixture of at least two of these substances, ... emitted, discharged or deposited or is likely to be emitted, discharged or deposited from any source which can directly or indirectly causes pollution and includes any environmentally hazardous substances."

By virtue of ***section 21 EQA***, the Minister, after consulting the Environmental Quality Council, may specify the acceptable conditions of emission, discharge or deposit of environmentally hazardous substances, pollutants or wastes into any area, segment or element of the environment.

Section 22 EQA restricts pollution in the atmosphere. It is the main provision on restriction on pollution of the atmosphere. Section 22(3) of the EQA also provides for punishment on those found guilty of the offences under subsection (1).

Open burning is prohibited under ***EQA 1974***. Open burning is defined under ***section 29A(3) EQA*** as:

"any fire, combustion or smouldering that occurs in the open air and which is not directed there through a chimney or stack."

If found guilty, a fine not exceeding RM500,000 is imposed or imprisonment not exceeding five years or both. ***Section 29B*** states that the owner or occupier of the premises who has control over such premises shall be deemed to have contravened ***s29A(1) EQA*** unless he is able to prove that the open burning occurred outside his control or without his knowledge or consent or that he took all reasonable precautions or exercised due diligence to prevent the commission of open burning (***S29C EQA***). Thus, if open burning occurs in a vast area of agricultural land, it is difficult to prove who is responsible for it.

S31 EQA provides:

"where any environmentally hazardous substances, pollutants or wastes are being or are likely to be emitted, discharged or deposited from any vehicle, ship or premises irrespective of whether the vehicle, ship or premises are prescribed under section 18 or otherwise, or from any aircraft, the Director General may by notice in writing require the owner or occupier of the vehicle, ship or premises, or aircraft, to (a) install and operate any control equipment or additional control equipment; (b) repair, alter or replace any equipment or control equipment; (c) erect or increase the height of any chimney; (d) measure, take a sample of, analyse, record and report any environmentally hazardous substances, pollutants, wastes, effluents or emissions containing pollutants; (e) conduct a study on any environmental risk; (f) install, maintain and operate monitoring programme at the expense of the owner or occupier; or (g) adopt any measure to reduce, mitigate, disperse, remove, eliminate, destroy or dispose of pollution, within such time and in such manner as may be specified in the notice."

S31A(2) EQA states:

"the Minister, in circumstances where he considers that the environment, public health or safety is under or likely to be under serious threat, may direct the Director General (a) to issue an order requiring a person to cease all acts that have resulted in the release of environmentally hazardous substances, pollutants or wastes; and (b) to effect and render any machinery, equipment, plant or process of the person inoperable."

Other important provisions related to air pollution are stated in ***s34A, s36A, s36B and s36C of the EQA*** which talks about reporting on impact on environment resulting from

prescribed activities, research cess, establishment of environmental fund and environmental fund committee.

Two ***EQA*** regulations that have relevance to air pollution are ***Environment Quality (Clean Air) Regulation 1978 and Environmental Quality (Prescribed Activities) (EIA) Order 1987***.

However, currently, there is no law which focuses purely on climate change. Issues relating to climate change can be found in bits and pieces in the above-mentioned laws. As a matter of fact, carbon dioxide is not even mentioned in the above-mentioned laws. One example can be seen in ***Regulation 27*** of ***the Environmental Quality (Clean Air) Regulation 1978*** where carbon dioxide is not even in the list of gases where limit of emission has been set for any trade, industry or process. Furthermore, there is no law in Malaysia that provides for some form of punishment for Malaysian companies which are responsibility for haze in other countries.

4.5 Fulfilling Malaysia's Commitment

Malaysia's fulfillment of its commitment can be seen from the point of view of greenhouse gas inventories, vulnerability to climate change (adaptation measures), greenhouse gas mitigation, research and systematic observation, education and awareness and finally in relation to the CDM.

4.5.1 Greenhouse Gases Inventory

The Danish International Development Agency (DANIDA) funded the Malaysia Energy Centre (Pusat Tenaga Malaysia) to conduct a study on the greenhouse gas inventory for

the energy sector for 2002.[113] The results are still preliminary but compared to the findings in 1994, there has been a significant increase in carbon dioxide emissions per capita from the energy sector.[114] Under the 8th Malaysia Plan, the Ministry of Natural Resources and Environment has tasked the Malaysia Energy Centre to carry out the Greenhouse Gas Inventory Study and the Forest Research Institute of Malaysia to estimate carbon sequestration of Malaysia's forest, rubber and forest plantations.[115]

4.5.2 Vulnerability to Climate Change (Adaptation Measures)

Though there is no direct explanation to adaptation, ***the UNFCCC*** considers it from the perspective of the impacts of climate change.[116] It focuses on taking of steps to counter the effect of climate change in order to make the social and environmental systems more resilient. ***The Article 2 of the UNFCCC*** states that aim of ***the UNFCCC*** is to stabilize greenhouse gas concentration at a level that allows ecosystems to adapt naturally to climate change so that food production is not threatened, while enabling economic development to proceed in a sustainable manner.[117] Such a level should be achieved within a time-frame sufficient to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner.[118] ***The UNFCCC*** has called for the cooperation among the parties to prepare for the adaptation to the impacts of climate change.[119] Normally, the groups which are likely to be affected by this change do not have the technical or financial resources to adapt. Thus, in Malaysia a significant part of the national response to climate change is to assess the vulnerability of sectors like

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[113] See note 101 at pg 16
[114] See note 101 at pg 16
[115] See note 100 at pg 16
[116] See note 100 at pg 16
[117] United Nations, United Nations Education Programme, *Training Manual on International Environmental Law*, (New York: United Nations, n.d.) at pg 113
[118] See note 100 at pg 16
[119] See note 100 at pg 16

agriculture, biodiversity, forestry, water and coastal resources, public health and energy and to identify policies or measures for adaptation.[120]

4.5.3 Greenhouse Gases Mitigation

The Malaysian Government has implemented several projects aimed at reducing emissions of the greenhouse gases through energy efficiency and renewable energy as well as demand side management in the energy sector.[121] The reason why the focus is on the energy sector is because this sector accounts for a bulk of the emission. These projects are funded by the United Nations Development Programme/Global Environment Facility which has targeted the industrial sector to improve energy efficiency and explore renewable sources through the biomass-based power generation and co-generation in the palm oil based industry and photovoltaic application for buildings.[122]

In the previous Malaysian Plan, it was stated that five percent of the Malaysian National Energy Limited's (Tenaga Nasional Berhad (TNB)) energy would come from a green source (renewable energy). But this was not achieved. However, in the latest Malaysian Plan, the amount was reduced to 350,000 megawatts which is not even three percent.[123] Currently, only 20 megawatts of energy comes from the green source which is through the CDM projects. The problem here is TNB is not willing to pay much for the renewable energy and this has been it unattractive to the independent energy suppliers to embark on clean energy. However, the previous Minister of Science, Technology and Environment, Dato' Seri Dr.Lim Keng Yaik said that TNB will buy clean energy at an attractive price.

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[120] See note 100 at pg 16
[121] See note 101 at pg 16
[122] See note 101 at pg 17
[123] See note 105

4.5.4 Research and Systematic Observation

The following key agencies[124] in Malaysia ensure that there is available scientific information which is accurate and reliable that could form the basis of the decision-making process in relation to climate change: -

- Malaysian Meteorological Services Department (MMS)
- Drainage and Irrigation Department (DID)
- Malaysian Centre for Remote Sensing (MACRES)
- Malaysian Department of Survey and Mapping

At the regional level, Malaysian scientists are involved in the IGBP/START/SARCS regional programmes on climate change.[125]

4.5.5 Education and Awareness

There are a lot of campaigns organized by the public and private sectors as well as non-governmental organisations in Malaysia in order to educate and create awareness among Malaysians about the effect of climate change for example the media coverage on the issues like the haze, El Nino and the La Nina. However, the response from these campaigns has been lukewarm.[126] It has been argued that this could have been due to lack of consistent information on trends and developments in these areas that reach the public and also the perception that individuals cannot do much to change the situation.[127] Example of agencies and groups that have started campaigns on education and awareness with the assistance of non-governmental organizations are Centre for Environment, Technology and Development, Malaysia (CETDEM) and Malaysian Nature Society. In 1992, an alliance was formed between CETDEM, the Environmental

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[124] See note 101 at pg 16
[125] See note 101 at pg 17
[126] See note 101 at pg 17
[127] See note 101 at pg 17

Protection Society of Malaysia (EPSM) and the Malaysian Nature Society (MNS) to form the Malaysian Climate Change Group (MCCG) which was joined by the Perak Consumers Association (PCA) in Aug 2002 as a member.[128] MCCG have been working are active in attending international conferences, organising public talks and fora, creating informative materials, to try to mobilise as many sectors of Malaysian society as possible to address the problems of climate, both local and global.[129] At the moment, the MCCG is in the midst of assessing how to expand its network and bring more committed public interest organisations on board.[130] At the start of 2002, the MCCG launched a new three-year public awareness project, Mobilizing Malaysians on Climate Change (MMCC). CETDEM, as the coordinating secretariat for the MCCG, administered the project, with funding from DANCED. The project has been successfully completed in May 2005.[131]

4.5.6 Clean Development Mechanism (CDM)

One of the mechanisms aimed to reduce the greenhouse gases in ***the Kyoto Protocol*** which is relevant to a developing country like Malaysia is the CDM.[132] Malaysia as a developing[133] country can only participate in the CDM. Though Malaysia has no quantitative commitments under ***the Kyoto Protocol*** but through the CDM, Malaysia can voluntarily participate in globally in helping reduce greenhouse gases emission. There are seven stages in the application of a CDM project. The CDM projects that Malaysia focuses on are energy, forestry and agriculture.[134] In total, since 2002, there have been 151 applicants.[135] In the year 2008 alone, there were 50 applications.[136] Out of these 50

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[128] CETDEM, homepage, CETDEM, 4 March 2009 http://www.cetdem.org.my/codenavia/portals/cetdemv1/code/main/main.php?parentID=11402411256168
[129] See note 127
[130] See note 128
[131] See note 128
[132] Malaysia, Pusat Tenaga Malaysia, *Malaysia CDM Information Handbook*, (Seri Kembangan: Pusat Tenaga Malaysia, 2006) at pg 3.
[133] Also referred to as non-Annex I country
[134] Interview with Radin Diana Radin Ahmad and Noorly Akmar Ramli, Malaysia Energy Centre, Personal Interview on 19 Feb 2009.
[135] See note 134
[136] See note 134

applications, 27 were registered with the Executive Board and have the CDM status and have started the project.[137] They were all energy based projects.[138]

The energy portion has been the most active with 27 being registered with Executive Board and has the CDM status and has started their respective project.[139] Out of this 27, six have received CER and are generating income.[140] Agriculture section has had 10 registrations but no issuance of CER so far.[141] There has been no application for forestry section so far.[142] The main partners so far has been from Netherlands, Japan and the United Kingdom. Since 2002, there has been an increase in the number of application but in 2009, so far as of 19 February 2009, there has only been one.[143]

The Malaysia Energy Centre has been creating awareness about CDM in Malaysia since 2002 by having various workshops especially with Tenaga Nasional Berhad (National Electricity Board) and FELDA.[144] This was done until 2006. This generated a lot of applications for the CDM projects. The applications for 2009 has been very low i.e. only one.[145] The process for one application takes between three to four months. In terms of percentage, Malaysia is on par if not slightly higher compared to its neighbouring countries, namely Thailand and Indonesia. The Malaysia Government has been supporting CDM by proving funds to the Malaysia Energy Centre.

[137] See note 134
[138] See note 134
[139] See note 134
[140] See note 134
[141] See note 134
[142] See note 134
[143] See note 134
[144] See note 134
[145] See note 134

4.6 Should Malaysia do anything?

Though Malaysia has no real obligation under ***the UNFCCC*** and ***the Kyoto Protocol*** but Malaysia can choose to be complacent. This is because change in climate affects all. As such, Malaysia has to take a proactive approach on this matter. This will be good for Malaysia as there will be a cleaner environment here plus this will give Malaysia a moral authority e.g. the State of Sao Paulo, Brazil. Despite the reluctance of the Brazil's federal government in taking early actions to protect the climate, the State of Sao Paulo implemented an environmental policy to that effect.[146] This state embarked on an ambitious reforestation programme funded by GEF and the World Bank which involves 'repairing' areas of the Atlantic rainforest that were deforested in the past.[147] This resulted in the State of Sao Paulo to stop this decreasing trend and even increase the area occupied by the Atlantic rainforest in the state.[148] It was argued that this is a massive achievement as it is exactly the opposite of what is happening in the rest of the country.[149]

Conclusion

Malaysia has done something so far to combat the issue of climate change but it is not good enough. More needs to be done here. ***The Environmental Quality Act 1974*** is only a regulatory framework. It is insufficient to address specific environmental issues especially those on air pollution.

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[146] Rei, F. & Cunha, K., "Regional Actions and Sustainable Development Strategies against Climate Change: Sao Paulo, Brazil", 2006, InterfacEHS, 16 February 2009 http://www.interfacehs.sp.senac.br/en/articles.asp?ed=5&cod_artigo=103

[147] The Climate Group, Interview with Suani Coelho, *The State's Action on Climate Change*, 2006, 16 February 2009 http://www.theclimategroup.org/news_and_events/professor_suani_coelho/

[148] See note 147

[149] See note 147

CHAPTER FIVE: PROPOSED ACTION AND ANALYSIS

Introduction

There are various possible actions which Malaysia could take in order to help reduce the change in the climate. However, not all of these proposed measures are feasible. The following are the summary of problems in Malaysia: -

1. Level of government commitment;
2. No policy solely on climate change;
3. No streamline of responsibility at the government level;
4. Laws;
5. Not enough done in mitigating emission of greenhouse gases
6. Clean development mechanism.

5.1 Action Proposed

Actions can be brought from three main aspects, namely mitigation, science and adaptability (vulnerability). This was suggested by Professor Dr. Khairulmaini Bin Osman Salleh[150] from University of Malaya Centre for Climate Change Affairs. Out of these three, mitigating action is the most important.[151] The mitigation actions include reducing the carbon emission level of the country. This can be done by improving the public transport, new laws and looking for alternative energy.

5.1.1 Science

One action which Malaysia could take to help reduce change in climate is in the area of science. Professor Dr. Khairulmaini Bin Osman Salleh[152] suggested that Malaysia can

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[150] Interview with Professor Dr. Khairulmaini Bin Osman Salleh, University of Malaya Centre for Climate Change Affairs, Personal Interview on 18 Feb 2009.
[151] See note 150
[152] See note 150

contribute to the area of science in climate change by proving local data to confirm the change of climate, thus creating the sense of urgency in the international arena to take appropriate action to reduce this change. However, this could be a difficult task because Malaysia is not in a position to do fundamental research on climate change because it is difficult to get data on climate change and it requires a lot of money for computers and special software to do so.[153] It has been suggested that a better approach would be to collect data on a smaller scale that is at a micro level of the country because currently most data available in a large scale.[154] Malaysia could also contribute in the area of science by looking at the adaptability to climate change issue, namely, the best way to adapt to flood.

5.1.2 Government Commitment

The climate change problem should be taken more seriously by the government by ensuring that relevant committees which have been set up for this purpose do meet up more regularly.[155] Currently, there is the Cabinet Committee on Climate Change which is chaired by the Malaysian Prime Minister and attended by various Ministers. However, until today, this committee has not even met once.[156] According to Maximilian T. Conrad from the Ministry of Natural Resources and Environment (NRE), this committee should meet some time this year with the new Prime Minister taking office in April 2009.[157] However, there is no non-governmental organization (NGO) representation in this committee which has caused some concerned among the NGOs.[158] There is another committee called the National Steering Committee on Climate Change which has met

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[153] Interview with Gurmit Singh, Environmental Protection Society Malaysia, Personal Interview on 17 March 2009.
[154] See note 153
[155] See note 153
[156] See note 153
[157] Interview with Maximilian T. Conrad, Ministry of Natural Resources and Environment (NRE), Personal Interview on 30 March 2009.
[158] See note 153

before but not on a regular basis and this committee has not been viewed as being effective.[159]

5.1.3 Policy

Malaysia needs a policy solely on climate change. At the moment, Malaysia has policies on many issues but not climate change. This proposed policy on climate change should also cover issues pertaining to adaptability to climate change. This is because change is definitely going to occur and it is better for Malaysia to be ready for this. This policy will help Malaysia strengthen their environmental management programmes by integrating climate change concerns into them.[160] The issue on adaptability should be addressed in this policy based on various sectors of the community especially those who are most vulnerable to change. According to Khairulmaini:

> "They need to address the issues of vulnerability and the adaptive capacities of their economic systems, with particular attention to the poor and those near the poverty line. To do this, Southeast Asian countries need to reassess their existing poverty line values to take into account the challenge of climate change threat. However, this needs to be done within the context of streamlining the climate change threat into existing environmental management strategies and national economic development programs."[161]

This will help create awareness among those who are most vulnerable to climate change. Once, these groups are aware, they can do their part in helping reduce climate change. Furthermore, any measures taken to reduce climate change must have this group in mind.

From this policy also, law on atmosphere can be created. At moment, there is law of the sea but not law of the atmosphere. Issues on climate change should also be incorporated to other policies where relevant in order to show the seriousness of this issue.

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[159] See note 153
[160] Michel, D. & Pandya, A., ed., *Climate Insecurity in Southern Asia: Designing Policies to Reduce Vulnerabilities*, (Washington, DC: Stimson, 2009).
[161] See note 160

Anyway, one reason why there is none at the moment now is probably because any measures taken to reduce climate change will incur cost and most people are only interested in making profit. Currently, Vietnam has a climate change policy. Anyway, according to Siti Khadijah Abdul Ghani from the Ministry of Natural Resources and Environment (NRE), Malaysia is in the midst of coming up with the policy on climate change.[162] Currently, it is still being drafted.[163] According to Maximilian T. Conrad from the Ministry of Natural Resources and Environment (NRE), various workshops are currently being held with various ministries, government agencies and non-governmental organizations on this issue.[164] He is very optimistic that it will be ready at the end of this year.[165] Whether or not this will ever materialize is left to be seen.

5.1.4 Streamlining Climate Change Responsibility

At the government level, the responsibility to curb climate change in Malaysia should be streamlined.[166] Malaysia should ensure that everything to do with climate change should fall under one ministry. This will ensure that all climate change related activities are managed properly. Currently in Malaysia, climate change falls within the responsibility of the Ministry of Natural Resources and Environment. Under this ministry, the Conservation and Environmental Management Division (CEMD) is in charge of it. This division is assisted by various governmental agencies. Some of these agencies come under the responsibility of other ministries. One example is in relation to Pusat Tenaga Malaysia (Malaysia Energy Centre). Pusat Tenaga Malaysia assists CEMD on CDM projects. The problem here is that Pusat Tenaga Malaysia comes under a different ministry which is Ministry of Energy, Communications and Multimedia (MECM), Malaysia. Pusat Tenaga

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[162] Interview with Siti Khadijah Abdul Ghani, Ministry of Natural Resources and Environment (NRE), Personal Interview on 25 Feb 2009.
[163] See note157
[164] See note157
[165] See note157
[166] See note157

Malaysia main responsibility is to its own ministry and it only assists CEMD on CDM projects. Another example is in relation to the Malaysian Metrological Department which assists CEMD on data collection and statistics on climate change. This department falls under the responsibility of the Ministry of Science, Technology and Innovation (MOSTI).

5.1.5 New Laws

The Malaysian Environmental Quality Act (EQA) 1974 is only a framework. It is inadequate to address specific environmental issues. This is especially so in the area of air pollution where emission of the greenhouse gases are concerned. As stated earlier, currently, there is no law which focuses purely on climate change. Issues relating to climate change can be found in bits and pieces in the above-mentioned laws. As a matter of fact, carbon dioxide is not even mentioned in the above-mentioned laws. Thus, a more specific and comprehensive law pertaining to the emission of the greenhouse gases into the atmosphere should be enacted. This law should be in line with the provisions, aims and objectives of ***the UNFCCC*** and ***the Kyoto Protocol***.

Furthermore, there are loopholes in ***the EQA*** on open burning especially if the burning occurs on an agriculture land which is open to all.[167] The law should be amended on this issue whereby making open burning an offence in this situation. There is also a need to have laws that punish Malaysian companies responsible for haze in other countries.[168]

5.1.6 Setting of Own Carbon Emission Target

Malaysia could set its own carbon dioxide emissions reduction target, perhaps by year 2020 irrespective of what ***the UNFCCC*** and ***Kyoto Protocol*** states. This can be achieved by having new laws on carbon emission and having a very effective, thorough

[167] As discussed in pg 66
[168] As discussed in pg 67

and corrupt free system of governance in enforcing this new law. However, this has been argued as not being a good move as the G77 countries may not react positively to this because the developed countries will use this as a precedent to force other developing countries to follow Malaysian example of setting a target[169]. This may cause a diplomatic problem especially with the G77 countries. Thus, politically this may not be a good move. Instead of setting targets, Maximilian T. Conrad from the Ministry of Natural Resources and Environment (NRE) said that a voluntary carbon offset scheme is preferred like the one used by the Malaysian Airlines System (MAS).[170] MAS has embarked on a scheme to reduce fuel consumption by flying more direct routes at the most economical speed, practicing continuous descent approaches and flying lighter and cleaner aircrafts to improve fuel efficiency.[171] This will help reduce the emission of greenhouse gases. Other companies within Malaysia should be encouraged to do this. MAS has also embarked on green programmes such as integrating 3R (reduce, reuse and recycle) waste management practices, energy conservation, pursuing and obtaining ISO140001 certifications for environmental management systems and increasing the use of biodegradable products.[172] MAS have also improved the awareness of their staff on the importance of curbing global warming.[173]

5.1.7 Hybrid cars

Another way how carbon emission can be reduced is by encouraging the use of hybrid cars. This can be done by ensuring that the car is cheap. This can be done by reducing the tax on this car. Currently, one example of a hybrid car sold in Malaysia is by Honda. The specific version is the Honda Civic. It is called Civic Hybrid. This model is similar to Honda Civic 1.8S. Therefore, if one looks at the price difference between the Civic Hybrid

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[169] See note 153
[170] See note 157
[171] *MAS Goes Green*, Malaysian Airlines System, 31 March 2009 http://www.malaysiaairlines.com/campaigns/
[172] See note 171
[173] See note 171

and the normal Civic 1.8S, the hybrid version is more expensive. The selling price (on the road) difference is shown below: -

Table 5.1: Selling price difference between a normal car and a hybrid car

	Peninsular Malaysia	Langkawi	Labuan
Civic Hybrid	RM 129,980.00	RM 100,980.00	RM 100,980.00
Civic 1.8S	RM 113,800.00	RM 71,800.00	RM 74,800.00

Based on the table above, it can be seen that the hybrid by Honda is more expensive compared to the similar model by Honda. If one compares the price difference between Langkawi/Labuan (which enjoys the tax free status) and the Peninsular Malaysia, the amount of tax imposed on a car can be ascertained. Based on the figure, it can be seen that the tax imposed on hybrid cars is almost about 30% which is very high. Therefore, the government must reduce this tax and thus help reduce the price of the hybrid cars in order to encourage people to buy these cars. There can be collaboration between the Ministry of Natural Resources and Environment (NRE), Transport Ministry, Finance Ministry and Information Ministry on this issue to reduce the tax and create awareness among the public to encourage the use of this car.

However, a hybrid car operates on dual mode. Like the one mentioned above, it still uses fossil fuel. Thus, it may not be a good solution to climate change because there will still be emission of carbon dioxide.[174] It will be better if there is a hybrid car which does not use fossil fuel and uses purely green energy.

[174] See note 153

5.1.8 Reducing Number of Cars on the Road

Another way how the carbon emission can be reduced is by reducing the number of vehicles on the road. This can be achieved by improving the public transport system in the country throughout all major cities especially in Kuala Lumpur and by carpooling.

5.1.8.1 Public Transport

One of the best ways to solve the climate change problem is by improving the current public transport system.[175] There have been talks on this issue for decades but the problem still persists.

There are many reasons why the people do not like to use the public transport. The first reason is because the bus drivers in Kuala Lumpur are not disciplined. They are very rude, not punctual and have a tendency to drive recklessly. The current 'profit sharing' arrangement between the bus company and the drivers has made the buses infrequent because they only start embarking on their route once the bus is full.

Though, there are light railway transits (LRT), commuter train and monorail but they have all failed to reduce the number of cars on the road because there is no matching of transport routes between them. The monorail in Kuala Lumpur ends a few hundred meters from the central station in Brickfields (KL Sentral) which is the central place where the Putra LRT, commuter train and KLIA Express meet. There is no proper link between STAR LRT and Putra LRT in Masjid India in Kuala Lumpur. These LRT stops are not in strategic places. This makes public transportation in Kuala Lumpur very inefficient and inconvenient.

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[175] See note 153

Thus, the government should strive to make public transportation in Malaysia especially in Kuala Lumpur reliable and affordable so that more people will start using it. Malaysia needs to learn how Singapore has made their public transport system so reliable and efficient.[176]

It is argued that the public transportation is the easiest option to reduce climate change but currently it is the most difficult to achieve. The management and planning of the public transportation need to be improved. There has to be good creation of proper network between various public transportation modes. There has to be stops at strategic places. Furthermore, currently there are too many government agencies that are overseeing the public transportation in Malaysia.[177] There are about thirteen at the moment. Thus, this creates too much of confusion. Therefore, it is better if things are streamlined here.

5.1.8.2 Carpooling

Carpooling can also help reduce cars on the road. Malaysia tried to introduce this back in the 1990s but failed. This can be achieved by creating awareness among the public. Again, Malaysia needs to learn from other countries on this issue such as Singapore.

5.1.9 More Stringent Checks on Heavy Vehicles

Currently, buses, taxis and lorries emit a lot of carbon gases. One reason for this is because they are not well-maintained. Thus, stricter and regular checks on buses, taxis and lorries are needed. New regulation to govern this is also needed. These checks are done by PUSPAKOM. This is another way to reduce carbon gas emission.

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[176] See note 153
[177] See note 153

5.1.10 Alternative Form of Energy

This is not an easy task because the cost involved is very high. It was suggested by the Third Assessment Report (TAR) of the IPCC that using nuclear energy can be an alternative to the conventional methods like coal. It was reported in the TAR that nuclear is a cleaner source of energy compared to the conventional methods like coal. However, there are a few problems associated with this proposal. One is the cost of going nuclear. It is very expensive. The second problem could be in terms of public concern because any problem associated with the nuclear plant like accidents or leak could result in disaster.

Encouraging the use of alternative form of energy rather than fossil fuel is another way to reduce carbon emission which can be achieved through research and development projects. Malaysia should look into ways to save energy as well as giving incentives for the development and use of renewable energy such as solar, biomass or wind.[178] This can be achieved through the CDM projects. There could be a public-private partnership here. Other source of alternative energy has been there for decades like solar and windmill but it has not been taken seriously especially in Malaysia. Windmill will not work here because Malaysia does not have strong winds. The cost of installing a solar energy system is too high. Biomass has potential but it must be based on agricultural waste and not raw palm oil or soya bean.[179] This is because if it is based on raw palm oil or soya bean, then too much of land may be required to plant these which may result in deforestation.

Cars that use natural gas have been around for a long time. These natural gas vehicles are environmentally friendly. Gas is also cheaper compared to petroleum. Though,

[178] Cheryl Rita Kaur, "Addressing Global Warming in Malaysia", *IMPAK,* 2008, 2
[179] See note 153

Malaysia is a producer of this gas but the use of it by vehicles has not been great. There are a few reasons for it, namely there are not many petrol kiosk that sell this gas. Another reason is that there is not much public awareness on this issue. Again, there can be collaboration between the Ministry of Natural Resources and Environment (NRE), Transport Ministry, Finance Ministry & Information Ministry on this issue to encourage the use and to create awareness among the public on the use of this gas as an alternative to petroleum. However, this is still fossil gas and it is only a short term solution. Renewable energy would be a better option.

Apart from the above, Malaysia should ensure that certain percentage of energy supplied by the Malaysian National Energy Limited (Tenaga Nasional Berhad) comes from a clean source.

5.1.11 Manufacturing

Manufacturing is one sector which has contributed to the increase of the greenhouse gases. This industry which accounts for an average 80% of industrial energy consumption, also accounts for an average 80% of industrial energy-related carbon emissions.[180] Thus, efforts must be enhanced to encourage those in this industry to reduce the emission of these gases. This can be done by having more stringent laws on air pollution.

Apart from having laws and regulations, this industry should be encouraged look into energy efficiency mechanism. An improvement in energy efficiency happens when the quantity of energy outputs needed for a given output is reduced which can be achieved by

[180] Ris Ramlee Ab. Hamid & Zailani Aman, "Manufacturing Sector Parctices in Reducing Carbon Emissions", *IMPAK*, 2008, 2

policy measures taken by government such as building regulations and support and information for business. This can be done through creating awareness.

Energy should be sold to the manufacturing industry at the market price and not at a subsidized price because this will ensure that there is energy efficiency in that industry.[181] This is to encourage the industry to make their products using lesser energy.

Fuel switching to lower carbon-content fuels such as from coal to natural gas can also help reduce carbon emission in this industry.[182] However, it will be better if the renewable energy comes from a green source rather than fossil gas.

Other methods include monitoring and reporting by the governmental agencies in order to determine what the annual emissions of this industry are and to provide updated information regularly to the public through the Carbon Disclosure Project.[183]

The government can encourage this industry to manage their waste effectively through laws or awareness or incentives. Waste management is another way to reduce carbon emission in this industry that is reducing refuse production or using alternative means of disposal that reduce greenhouse gases emission from waste decomposition.[184]

5.1.12 Reducing Emissions from Agricultural Sources

This industry contributes 15% of the nation's total greenhouse gases emission. However, it also creates carbon sink. However, measures can be taken to reduce or offset GHG emission. This can be done through carbon sequestration in agricultural soils and using

[181] See note 153
[182] See note 180
[183] See note 180
[184] See note 180

tree shelterbelts in order to minimize soil erosion and stabilize soil carbon. However, carbon sequestration involves high cost and may lead to other problems.[185] Tree shelterbelts may not make much difference because there are issues on planting and managing them.[186]

5.1.13 Take Measures to Increase Carbon Sink

This can be done by reducing deforestation and also preserve the mangrove forest. This can be done through new laws, stricter system of governance and enforcement.

5.1.14 Create Awareness among the Public

Though there have been campaigns organized by the public and private sectors and non-governmental organizations but according to the Conservation and Environmental Management Division (CEMD) of the Ministry of Natural Resources and Environment (NRE), the response has been lukewarm.[187] Therefore, a different approach and strategy should be undertaken. Creating awareness among the public about the importance of taking measures to reduce the change in climate is one of the best ways to reduce climate change.[188] This can be done through collaboration between various Ministries such as the Education Ministry, the Information Ministry, Transport Ministry, the Human Resources Ministry and the Ministry of Natural Resources and Environment.

The Ministry of Natural Resources and Environment should collaborate with the Human Resource Ministry to encourage and help them create training programmes on the importance of taking measures to reduce climate change. The Human Resource Ministry should then make it compulsory for workers to take these training programmes. The

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[185] See note 153
[186] See note 153
[187] Malaysia, Conservation and Environmental Management Division (CEMD), Ministry of Natural Resources and Environment, *Climate Change in Malaysia*, (Putrajaya: CEMD, 2005) at pg 17.
[188] See note 157

Human Resource Development Fund could be used to finance this training. Once workers know the importance of helping reduce the climate change, they can put this in practice both at their workplace and at their homes. Once they are aware, they will not simply waste energy in an organization like leaving the lights and air-condition on when they are away for lunch.

The Education Ministry and the Ministry of Natural Resources and Environment should collaborate in order to create awareness among the students about global warming and climate change matters. This can be done by having a subject on climate change at the primary, secondary and tertiary level of school to increase public education and awareness with regard to global warming and climate change matters.

5.1.15 Clean Development Mechanism (CDM)

Based on the interview[189] conducted with the Research Officers from the Malaysia Energy Centre, a lot of awareness programmes which included workshops were conducted at the initial stage in order to create awareness among Malaysians about CDM. This was done until 2006. Though this generated a lot of applications for the CDM projects until 2008 but in 2009, the number of applicants is very low. In the first two months of 2009, there has only been one application. Thus, the Malaysia Energy Centre should have a continuous promotional programme about CDM which can continuously create awareness among Malaysians about the potential benefits of CDM. This is because once a promotion stops, after a while people have a tendency to forget and this may have very much happen in Malaysia.

[189] Interview with Radin Diana Radin Ahmad and Noorly Akmar Ramli, Malaysia Energy Centre, Personal Interview on 19 Feb 2009.

There were also some applicants who once they obtained the relevant approval, they did not continue with the project.[190] This can be minimized by having follow-ups with the applicants once their application has been approved. If they choose not to continue, the reasons behind this must be ascertained.

Currently, most of the applicants have only focused on energy based projects.[191] Malaysia Energy Centre should put in more effort to promote the agricultural and forestry based projects too. There have been only 10 registered projects which are of agricultural based with no issuance of CER. There has been no application for forestry based projects. This statistics show that more effort must be put here to ensure that both agricultural and forestry based projects receive equal response.

Conclusion

Based on the facts above, it can be seen that the measures proposed above may help Malaysia reduce the greenhouse gases concentration in the atmosphere here. It will reduce carbon emission and increase carbon sink which is good for the future of Malaysia.

[190] See note 189
[191] See note 189

CHAPTER SIX: IN CONCLUSION

Introduction

This international obligation to reduce carbon emission and reduce climate change should be taken by Malaysia because it is not only an obligation but collective obligation to protect the natural environment for the future generation.

6.1 Summary of Proposed Actions

The measures proposed can be summarized as follows: -

a. Science

Malaysia should collect data in a more micro level in order to show that climate change is occurring and thus, create urgency in the international arena to take mitigative measures.

b. Government Commitment

The government should make it apparent that they are taking this problem seriously by ensuring that whatever committees formed meet regularly. The Cabinet Committee on Climate Change should meet and discuss issues related on climate change and there should be some NGO representation in this committee. Since this committee is chaired by the Prime Minister and attended by various ministers, all related ministries will be able to take actions to curb the climate change problem. Other committees such as the National Steering Committee on Climate Change should meet for regularly.

c. Having a national policy on climate change

Malaysia needs a national policy which focuses purely and entirely on climate change so that any subsequent future actions for mitigation and adaptation would be based on this.

d. Streamlining Climate Change Responsibility

At the government level, the responsibility to curb climate change in Malaysia should be streamlined into one ministry. Currently, issues relating to climate change are handled by more than one ministry in Malaysia. As a result of this, there is no streamlining of responsibility. Thus, Malaysia should follow other countries such as Australia where there is a Department of Climate Change. This will ensure that all climate change related activities are managed properly.

e. New laws

There should be laws which focus solely on the issue of climate change which is in line with the Kyoto Protocol. Carbon dioxide must be listed as a gas which needs to be controlled and reduced in emission. There should be laws penalizing Malaysian companies which are responsible for open burning in other countries.[192]

f. Voluntary Carbon Offset Scheme

Such a scheme which is being implemented by MAS should be encouraged by the government so that other organizations will do the same.

[192] Refer pg 67

g. Hybrid cars

This should be encouraged by reducing the price of the car. This can be achieved by reducing the tax imposed on this car. There should be more effort placed to encourage the development of a hybrid car which does not use fossil energy.

h. Improve the public transportation system

The public transportation system needs to be improved through proper management and planning so that more people will start using it and the number of cars will be reduced on the road.

i. Carpooling

This should be started again through proper and sustainable campaigns to reduce the number of cars on the road. This can be done by creating public awareness through media about the importance and benefits of carpooling. Some form of levy can also be imposed on single occupant cars which enter the city during peak hours. This will encourage people to carpool.

j. More stringent checks on heavy vehicles

There should be stricter laws and proper governance on this issue. This will ensure that these vehicles are properly maintained and thus not emit a lot of greenhouse gases.

k. Looking into alternative form of energy

Malaysia should encourage and look for alternative form of energy through research and development. Biomass from agricultural waste should be encouraged. Use of natural gas should also be encouraged. There should be an increase amount of

energy coming from the clean source. This can be done by the Malaysian National Energy Limited (Tenaga Nasional Berhad).

l. **Reducing carbon emission in the manufacturing industry**

This can be done through stringent laws, constant monitoring, energy efficiency, fuel switching and waste management. Energy should be sold to them at the market price and not at a subsidized rate. This is because when energy is sold at the market rate to these industries, they will have to look at ways to save energy to reduce cost. Other methods include monitoring and reporting by the governmental agencies in order to determine what the annual emissions are of this industry and to provide updated information regularly to the public through the Carbon Disclosure Project.

m. **Increase carbon sink areas**

This can be done by reducing deforestation and also preserve the mangrove forest. This is because as discussed earlier, forests do play a very important role in helping reduce the amount of carbon dioxide in the atmosphere. Conserving forest can be done through new laws, stricter system of governance and enforcement.

n. **Create awareness through collaboration of various ministries**

There should be collaboration between various ministries to create awareness among the public about climate change in Malaysia.

o. **Relooking the Clean Development Mechanism project**

Malaysia should encourage more and ensure that the projects are not focusing on one area only but also other areas like forestry and agriculture.

Concluding Thoughts

By taking the abovementioned measures to reduce climate change, Malaysia's economy will not be adversely affected financially. This is because most of the measures proposed above does not cost much and will not adversely affect the Malaysian economy. Furthermore, if these measures are taken and the Malaysian climate is stabilized, changes will not take place too drastically and as such, Malaysia will not have to bear the cost of adaptability due to the effect of climate change which could be far worse.

Anyway, ambitions cannot be achieved in a short period. It requires firm policy decision and educating and capacity building of people which in a day cannot be achieved. Therefore, it has to start now so that the results can be seen sooner rather than later.

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APPENDIX A

THE UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE

UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE

UNITED NATIONS
1992

FCCC/INFORMAL/84
GE.05-62220 (E) 200705

UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE

The Parties to this Convention,

Acknowledging that change in the Earth's climate and its adverse effects are a common concern of humankind,

Concerned that human activities have been substantially increasing the atmospheric concentrations of greenhouse gases, that these increases enhance the natural greenhouse effect, and that this will result on average in an additional warming of the Earth's surface and atmosphere and may adversely affect natural ecosystems and humankind,

Noting that the largest share of historical and current global emissions of greenhouse gases has originated in developed countries, that per capita emissions in developing countries are still relatively low and that the share of global emissions originating in developing countries will grow to meet their social and development needs,

Aware of the role and importance in terrestrial and marine ecosystems of sinks and reservoirs of greenhouse gases,

Noting that there are many uncertainties in predictions of climate change, particularly with regard to the timing, magnitude and regional patterns thereof,

Acknowledging that the global nature of climate change calls for the widest possible cooperation by all countries and their participation in an effective and appropriate international response, in accordance with their common but differentiated responsibilities and respective capabilities and their social and economic conditions,

Recalling the pertinent provisions of the Declaration of the United Nations Conference on the Human Environment, adopted at Stockholm on 16 June 1972,

Recalling also that States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental and developmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction,

Reaffirming the principle of sovereignty of States in international cooperation to address climate change,

Recognizing that States should enact effective environmental legislation, that environmental standards, management objectives and priorities should reflect the environmental and developmental context to which they apply, and that standards applied by some countries may be inappropriate and of unwarranted economic and social cost to other countries, in particular developing countries,

Recalling the provisions of General Assembly resolution 44/228 of 22 December 1989 on the United Nations Conference on Environment and Development, and resolutions 43/53 of 6 December 1988, 44/207 of 22 December 1989, 45/212 of 21 December 1990 and 46/169 of 19 December 1991 on protection of global climate for present and future generations of mankind,

Recalling also the provisions of General Assembly resolution 44/206 of 22 December 1989 on the possible adverse effects of sea-level rise on islands and coastal areas, particularly low-lying coastal areas and the pertinent provisions of General Assembly resolution 44/172 of 19 December 1989 on the implementation of the Plan of Action to Combat Desertification,

Recalling further the Vienna Convention for the Protection of the Ozone Layer, 1985, and the Montreal Protocol on Substances that Deplete the Ozone Layer, 1987, as adjusted and amended on 29 June 1990,

Noting the Ministerial Declaration of the Second World Climate Conference adopted on 7 November 1990,

Conscious of the valuable analytical work being conducted by many States on climate change and of the important contributions of the World Meteorological Organization, the United Nations Environment Programme and other organs, organizations and bodies of the United Nations system, as well as other international and intergovernmental bodies, to the exchange of results of scientific research and the coordination of research,

Recognizing that steps required to understand and address climate change will be environmentally, socially and economically most effective if they are based on relevant scientific, technical and economic considerations and continually re-evaluated in the light of new findings in these areas,

Recognizing that various actions to address climate change can be justified economically in their own right and can also help in solving other environmental problems,

Recognizing also the need for developed countries to take immediate action in a flexible manner on the basis of clear priorities, as a first step towards comprehensive response strategies at the global, national and, where agreed, regional levels that take into account all greenhouse gases, with due consideration of their relative contributions to the enhancement of the greenhouse effect,

Recognizing further that low-lying and other small island countries, countries with low-lying coastal, arid and semi-arid areas or areas liable to floods, drought and desertification, and developing countries with fragile mountainous ecosystems are particularly vulnerable to the adverse effects of climate change,

Recognizing the special difficulties of those countries, especially developing countries, whose economies are particularly dependent on fossil fuel production, use and exportation, as a consequence of action taken on limiting greenhouse gas emissions,

Affirming that responses to climate change should be coordinated with social and economic development in an integrated manner with a view to avoiding adverse impacts on the latter, taking into full account the legitimate priority needs of developing countries for the achievement of sustained economic growth and the eradication of poverty,

Recognizing that all countries, especially developing countries, need access to resources required to achieve sustainable social and economic development and that, in order for developing countries to progress towards that goal, their energy consumption will need to grow taking into account the possibilities for achieving greater energy efficiency and for controlling greenhouse gas emissions in general, including through the application of new technologies on terms which make such an application economically and socially beneficial,

Determined to protect the climate system for present and future generations,

Have agreed as follows:

Article 1

DEFINITIONS*

For the purposes of this Convention:

1. "Adverse effects of climate change" means changes in the physical environment or biota resulting from climate change which have significant deleterious effects on the composition, resilience or productivity of natural and managed ecosystems or on the operation of socio-economic systems or on human health and welfare.

2. "Climate change" means a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods.

3. "Climate system" means the totality of the atmosphere, hydrosphere, biosphere and geosphere and their interactions.

4. "Emissions" means the release of greenhouse gases and/or their precursors into the atmosphere over a specified area and period of time.

5. "Greenhouse gases" means those gaseous constituents of the atmosphere, both natural and anthropogenic, that absorb and re-emit infrared radiation.

6. "Regional economic integration organization" means an organization constituted by sovereign States of a given region which has competence in respect of matters governed by this Convention or its protocols and has been duly authorized, in accordance with its internal procedures, to sign, ratify, accept, approve or accede to the instruments concerned.

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* Titles of articles are included solely to assist the reader.

7. "Reservoir" means a component or components of the climate system where a greenhouse gas or a precursor of a greenhouse gas is stored.

8. "Sink" means any process, activity or mechanism which removes a greenhouse gas, an aerosol or a precursor of a greenhouse gas from the atmosphere.

9. "Source" means any process or activity which releases a greenhouse gas, an aerosol or a precursor of a greenhouse gas into the atmosphere.

Article 2

OBJECTIVE

The ultimate objective of this Convention and any related legal instruments that the Conference of the Parties may adopt is to achieve, in accordance with the relevant provisions of the Convention, stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be achieved within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner.

Article 3

PRINCIPLES

In their actions to achieve the objective of the Convention and to implement its provisions, the Parties shall be guided, inter alia, by the following:

1. The Parties should protect the climate system for the benefit of present and future generations of humankind, on the basis of equity and in accordance with their common but differentiated responsibilities and respective capabilities. Accordingly, the developed country Parties should take the lead in combating climate change and the adverse effects thereof.

2. The specific needs and special circumstances of developing country Parties, especially those that are particularly vulnerable to the adverse effects of climate change, and of those Parties, especially developing country Parties, that would have to bear a disproportionate or abnormal burden under the Convention, should be given full consideration.

3. The Parties should take precautionary measures to anticipate, prevent or minimize the causes of climate change and mitigate its adverse effects. Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing such measures, taking into account that policies and measures to deal with climate change should be cost-effective so as to ensure global benefits at the lowest possible cost. To achieve this, such policies and measures should take into account different socio-economic contexts, be comprehensive, cover all relevant sources, sinks and reservoirs of greenhouse gases and adaptation, and comprise all economic sectors. Efforts to address climate change may be carried out cooperatively by interested Parties.

4. The Parties have a right to, and should, promote sustainable development. Policies and measures to protect the climate system against human-induced change should be appropriate for the specific conditions of each Party and should be integrated with national development programmes, taking into account that economic development is essential for adopting measures to address climate change.

5. The Parties should cooperate to promote a supportive and open international economic system that would lead to sustainable economic growth and development in all Parties, particularly developing country Parties, thus enabling them better to address the problems of climate change. Measures taken to combat climate change, including unilateral ones, should not constitute a means of arbitrary or unjustifiable discrimination or a disguised restriction on international trade.

Article 4

COMMITMENTS

1. All Parties, taking into account their common but differentiated responsibilities and their specific national and regional development priorities, objectives and circumstances, shall:

(a) Develop, periodically update, publish and make available to the Conference of the Parties, in accordance with Article 12, national inventories of anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol, using comparable methodologies to be agreed upon by the Conference of the Parties;

(b) Formulate, implement, publish and regularly update national and, where appropriate, regional programmes containing measures to mitigate climate change by addressing anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol, and measures to facilitate adequate adaptation to climate change;

(c) Promote and cooperate in the development, application and diffusion, including transfer, of technologies, practices and processes that control, reduce or prevent anthropogenic emissions of greenhouse gases not controlled by the Montreal Protocol in all relevant sectors, including the energy, transport, industry, agriculture, forestry and waste management sectors;

(d) Promote sustainable management, and promote and cooperate in the conservation and enhancement, as appropriate, of sinks and reservoirs of all greenhouse gases not controlled by the Montreal Protocol, including biomass, forests and oceans as well as other terrestrial, coastal and marine ecosystems;

(e) Cooperate in preparing for adaptation to the impacts of climate change; develop and elaborate appropriate and integrated plans for coastal zone management, water resources and agriculture, and for the protection and rehabilitation of areas, particularly in Africa, affected by drought and desertification, as well as floods;

(f) Take climate change considerations into account, to the extent feasible, in their relevant social, economic and environmental policies and actions, and employ appropriate methods, for example impact assessments, formulated and determined nationally, with a view to minimizing adverse effects on the economy, on public health and on the quality of the environment, of projects or measures undertaken by them to mitigate or adapt to climate change;

(g) Promote and cooperate in scientific, technological, technical, socio-economic and other research, systematic observation and development of data archives related to the climate system and intended to further the understanding and to reduce or eliminate the remaining uncertainties regarding the causes, effects, magnitude and timing of climate change and the economic and social consequences of various response strategies;

(h) Promote and cooperate in the full, open and prompt exchange of relevant scientific, technological, technical, socio-economic and legal information related to the climate system and climate change, and to the economic and social consequences of various response strategies;

(i) Promote and cooperate in education, training and public awareness related to climate change and encourage the widest participation in this process, including that of non-governmental organizations; and

(j) Communicate to the Conference of the Parties information related to implementation, in accordance with Article 12.

2. The developed country Parties and other Parties included in Annex I commit themselves specifically as provided for in the following:

(a) Each of these Parties shall adopt national[1] policies and take corresponding measures on the mitigation of climate change, by limiting its anthropogenic emissions of greenhouse gases and protecting and enhancing its greenhouse gas sinks and reservoirs. These policies and measures will demonstrate that developed countries are taking the lead in modifying longer-term trends in anthropogenic emissions consistent with the objective of the Convention, recognizing that the return by the end of the present decade to earlier levels of anthropogenic emissions of carbon dioxide and other greenhouse gases not controlled by the Montreal Protocol would contribute to such modification, and taking into account the differences in these Parties' starting points and approaches, economic structures and resource bases, the need to maintain strong and sustainable economic growth, available technologies and other individual circumstances, as well as the need for equitable and appropriate contributions by each of these Parties to the global effort regarding that objective. These Parties may implement such policies and measures jointly with other Parties and may assist other Parties in contributing to the achievement of the objective of the Convention and, in particular, that of this subparagraph;

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[1] This includes policies and measures adopted by regional economic integration organizations.

(b) In order to promote progress to this end, each of these Parties shall communicate, within six months of the entry into force of the Convention for it and periodically thereafter, and in accordance with Article 12, detailed information on its policies and measures referred to in subparagraph (a) above, as well as on its resulting projected anthropogenic emissions by sources and removals by sinks of greenhouse gases not controlled by the Montreal Protocol for the period referred to in subparagraph (a), with the aim of returning individually or jointly to their 1990 levels these anthropogenic emissions of carbon dioxide and other greenhouse gases not controlled by the Montreal Protocol. This information will be reviewed by the Conference of the Parties, at its first session and periodically thereafter, in accordance with Article 7;

(c) Calculations of emissions by sources and removals by sinks of greenhouse gases for the purposes of subparagraph (b) above should take into account the best available scientific knowledge, including of the effective capacity of sinks and the respective contributions of such gases to climate change. The Conference of the Parties shall consider and agree on methodologies for these calculations at its first session and review them regularly thereafter;

(d) The Conference of the Parties shall, at its first session, review the adequacy of subparagraphs (a) and (b) above. Such review shall be carried out in the light of the best available scientific information and assessment on climate change and its impacts, as well as relevant technical, social and economic information. Based on this review, the Conference of the Parties shall take appropriate action, which may include the adoption of amendments to the commitments in subparagraphs (a) and (b) above. The Conference of the Parties, at its first session, shall also take decisions regarding criteria for joint implementation as indicated in subparagraph (a) above. A second review of subparagraphs (a) and (b) shall take place not later than 31 December 1998, and thereafter at regular intervals determined by the Conference of the Parties, until the objective of the Convention is met;

(e) Each of these Parties shall:

(i) coordinate as appropriate with other such Parties, relevant economic and administrative instruments developed to achieve the objective of the Convention; and

(ii) identify and periodically review its own policies and practices which encourage activities that lead to greater levels of anthropogenic emissions of greenhouse gases not controlled by the Montreal Protocol than would otherwise occur;

(f) The Conference of the Parties shall review, not later than 31 December 1998, available information with a view to taking decisions regarding such amendments to the lists in Annexes I and II as may be appropriate, with the approval of the Party concerned;

(g) Any Party not included in Annex I may, in its instrument of ratification, acceptance, approval or accession, or at any time thereafter, notify the Depositary that it intends to be bound by subparagraphs (a) and (b) above. The Depositary shall inform the other signatories and Parties of any such notification.

3. The developed country Parties and other developed Parties included in Annex II shall provide new and additional financial resources to meet the agreed full costs incurred by developing country Parties in complying with their obligations under Article 12, paragraph 1. They shall also provide such financial resources, including for the transfer of technology, needed by the developing country Parties to meet the agreed full incremental costs of implementing measures that are covered by paragraph 1 of this Article and that are agreed between a developing country Party and the international entity or entities referred to in Article 11, in accordance with that Article. The implementation of these commitments shall take into account the need for adequacy and predictability in the flow of funds and the importance of appropriate burden sharing among the developed country Parties.

4. The developed country Parties and other developed Parties included in Annex II shall also assist the developing country Parties that are particularly vulnerable to the adverse effects of climate change in meeting costs of adaptation to those adverse effects.

5. The developed country Parties and other developed Parties included in Annex II shall take all practicable steps to promote, facilitate and finance, as appropriate, the transfer of, or access to, environmentally sound technologies and know-how to other Parties, particularly developing country Parties, to enable them to implement the provisions of the Convention. In this process, the developed country Parties shall support the development and enhancement of endogenous capacities and technologies of developing country Parties. Other Parties and organizations in a position to do so may also assist in facilitating the transfer of such technologies.

6. In the implementation of their commitments under paragraph 2 above, a certain degree of flexibility shall be allowed by the Conference of the Parties to the Parties included in Annex I undergoing the process of transition to a market economy, in order to enhance the ability of these Parties to address climate change, including with regard to the historical level of anthropogenic emissions of greenhouse gases not controlled by the Montreal Protocol chosen as a reference.

7. The extent to which developing country Parties will effectively implement their commitments under the Convention will depend on the effective implementation by developed country Parties of their commitments under the Convention related to financial resources and transfer of technology and will take fully into account that economic and social development and poverty eradication are the first and overriding priorities of the developing country Parties.

8. In the implementation of the commitments in this Article, the Parties shall give full consideration to what actions are necessary under the Convention, including actions related to funding, insurance and the transfer of technology, to meet the specific needs and concerns of developing country Parties arising from the adverse effects of climate change and/or the impact of the implementation of response measures, especially on:

(a) Small island countries;

(b) Countries with low-lying coastal areas;

(c) Countries with arid and semi-arid areas, forested areas and areas liable to forest decay;

(d) Countries with areas prone to natural disasters;

(e) Countries with areas liable to drought and desertification;

(f) Countries with areas of high urban atmospheric pollution;

(g) Countries with areas with fragile ecosystems, including mountainous ecosystems;

(h) Countries whose economies are highly dependent on income generated from the production, processing and export, and/or on consumption of fossil fuels and associated energy-intensive products; and

(i) Landlocked and transit countries.

Further, the Conference of the Parties may take actions, as appropriate, with respect to this paragraph.

9. The Parties shall take full account of the specific needs and special situations of the least developed countries in their actions with regard to funding and transfer of technology.

10. The Parties shall, in accordance with Article 10, take into consideration in the implementation of the commitments of the Convention the situation of Parties, particularly developing country Parties, with economies that are vulnerable to the adverse effects of the implementation of measures to respond to climate change. This applies notably to Parties with economies that are highly dependent on income generated from the production, processing and export, and/or consumption of fossil fuels and associated energy-intensive products and/or the use of fossil fuels for which such Parties have serious difficulties in switching to alternatives.

Article 5

RESEARCH AND SYSTEMATIC OBSERVATION

In carrying out their commitments under Article 4, paragraph 1 (g), the Parties shall:

(a) Support and further develop, as appropriate, international and intergovernmental programmes and networks or organizations aimed at defining, conducting, assessing and financing research, data collection and systematic observation, taking into account the need to minimize duplication of effort;

(b) Support international and intergovernmental efforts to strengthen systematic observation and national scientific and technical research capacities and capabilities, particularly in developing countries, and to promote access to, and the exchange of, data and analyses thereof obtained from areas beyond national jurisdiction; and

(c) Take into account the particular concerns and needs of developing countries and cooperate in improving their endogenous capacities and capabilities to participate in the efforts referred to in subparagraphs (a) and (b) above.

Article 6

EDUCATION, TRAINING AND PUBLIC AWARENESS

In carrying out their commitments under Article 4, paragraph 1 (i), the Parties shall:

(a) Promote and facilitate at the national and, as appropriate, subregional and regional levels, and in accordance with national laws and regulations, and within their respective capacities:

(i) the development and implementation of educational and public awareness programmes on climate change and its effects;

(ii) public access to information on climate change and its effects;

(iii) public participation in addressing climate change and its effects and developing adequate responses; and

(iv) training of scientific, technical and managerial personnel;

(b) Cooperate in and promote, at the international level, and, where appropriate, using existing bodies:

(i) the development and exchange of educational and public awareness material on climate change and its effects; and

(ii) the development and implementation of education and training programmes, including the strengthening of national institutions and the exchange or secondment of personnel to train experts in this field, in particular for developing countries.

Article 7

CONFERENCE OF THE PARTIES

1. A Conference of the Parties is hereby established.

2. The Conference of the Parties, as the supreme body of this Convention, shall keep under regular review the implementation of the Convention and any related legal instruments that the Conference of the Parties may adopt, and shall make, within its mandate, the decisions necessary to promote the effective implementation of the Convention. To this end, it shall:

(a) Periodically examine the obligations of the Parties and the institutional arrangements under the Convention, in the light of the objective of the Convention, the experience gained in its implementation and the evolution of scientific and technological knowledge;

(b) Promote and facilitate the exchange of information on measures adopted by the Parties to address climate change and its effects, taking into account the differing circumstances, responsibilities and capabilities of the Parties and their respective commitments under the Convention;

(c) Facilitate, at the request of two or more Parties, the coordination of measures adopted by them to address climate change and its effects, taking into account the differing circumstances, responsibilities and capabilities of the Parties and their respective commitments under the Convention;

(d) Promote and guide, in accordance with the objective and provisions of the Convention, the development and periodic refinement of comparable methodologies, to be agreed on by the Conference of the Parties, inter alia, for preparing inventories of greenhouse gas emissions by sources and removals by sinks, and for evaluating the effectiveness of measures to limit the emissions and enhance the removals of these gases;

(e) Assess, on the basis of all information made available to it in accordance with the provisions of the Convention, the implementation of the Convention by the Parties, the overall effects of the measures taken pursuant to the Convention, in particular environmental, economic and social effects as well as their cumulative impacts and the extent to which progress towards the objective of the Convention is being achieved;

(f) Consider and adopt regular reports on the implementation of the Convention and ensure their publication;

(g) Make recommendations on any matters necessary for the implementation of the Convention;

(h) Seek to mobilize financial resources in accordance with Article 4, paragraphs 3, 4 and 5, and Article 11;

(i) Establish such subsidiary bodies as are deemed necessary for the implementation of the Convention;

(j) Review reports submitted by its subsidiary bodies and provide guidance to them;

(k) Agree upon and adopt, by consensus, rules of procedure and financial rules for itself and for any subsidiary bodies;

(l) Seek and utilize, where appropriate, the services and cooperation of, and information provided by, competent international organizations and intergovernmental and non-governmental bodies; and

(m) Exercise such other functions as are required for the achievement of the objective of the Convention as well as all other functions assigned to it under the Convention.

3. The Conference of the Parties shall, at its first session, adopt its own rules of procedure as well as those of the subsidiary bodies established by the Convention, which shall include decision-making procedures for matters not already covered by decision-making procedures stipulated in the Convention. Such procedures may include specified majorities required for the adoption of particular decisions.

4. The first session of the Conference of the Parties shall be convened by the interim secretariat referred to in Article 21 and shall take place not later than one year after the date of entry into force of the Convention. Thereafter, ordinary sessions of the Conference of the Parties shall be held every year unless otherwise decided by the Conference of the Parties.

5. Extraordinary sessions of the Conference of the Parties shall be held at such other times as may be deemed necessary by the Conference, or at the written request of any Party, provided that, within six months of the request being communicated to the Parties by the secretariat, it is supported by at least one third of the Parties.

6. The United Nations, its specialized agencies and the International Atomic Energy Agency, as well as any State member thereof or observers thereto not Party to the Convention, may be represented at sessions of the Conference of the Parties as observers. Any body or agency, whether national or international, governmental or non-governmental, which is qualified in matters covered by the Convention, and which has informed the secretariat of its wish to be represented at a session of the Conference of the Parties as an observer, may be so admitted unless at least one third of the Parties present object. The admission and participation of observers shall be subject to the rules of procedure adopted by the Conference of the Parties.

Article 8

SECRETARIAT

1. A secretariat is hereby established.

2. The functions of the secretariat shall be:

(a) To make arrangements for sessions of the Conference of the Parties and its subsidiary bodies established under the Convention and to provide them with services as required;

(b) To compile and transmit reports submitted to it;

(c) To facilitate assistance to the Parties, particularly developing country Parties, on request, in the compilation and communication of information required in accordance with the provisions of the Convention;

(d) To prepare reports on its activities and present them to the Conference of the Parties;

(e) To ensure the necessary coordination with the secretariats of other relevant international bodies;

(f) To enter, under the overall guidance of the Conference of the Parties, into such administrative and contractual arrangements as may be required for the effective discharge of its functions; and

(g) To perform the other secretariat functions specified in the Convention and in any of its protocols and such other functions as may be determined by the Conference of the Parties.

3. The Conference of the Parties, at its first session, shall designate a permanent secretariat and make arrangements for its functioning.

Article 9

SUBSIDIARY BODY FOR SCIENTIFIC AND TECHNOLOGICAL ADVICE

1. A subsidiary body for scientific and technological advice is hereby established to provide the Conference of the Parties and, as appropriate, its other subsidiary bodies with timely information and advice on scientific and technological matters relating to the Convention. This body shall be open to participation by all Parties and shall be multidisciplinary. It shall comprise government representatives competent in the relevant field of expertise. It shall report regularly to the Conference of the Parties on all aspects of its work.

2. Under the guidance of the Conference of the Parties, and drawing upon existing competent international bodies, this body shall:

(a) Provide assessments of the state of scientific knowledge relating to climate change and its effects;

(b) Prepare scientific assessments on the effects of measures taken in the implementation of the Convention;

(c) Identify innovative, efficient and state-of-the-art technologies and know-how and advise on the ways and means of promoting development and/or transferring such technologies;

(d) Provide advice on scientific programmes, international cooperation in research and development related to climate change, as well as on ways and means of supporting endogenous capacity-building in developing countries; and

(e) Respond to scientific, technological and methodological questions that the Conference of the Parties and its subsidiary bodies may put to the body.

3. The functions and terms of reference of this body may be further elaborated by the Conference of the Parties.

Article 10

SUBSIDIARY BODY FOR IMPLEMENTATION

1. A subsidiary body for implementation is hereby established to assist the Conference of the Parties in the assessment and review of the effective implementation of the Convention. This body shall be open to participation by all Parties and comprise government representatives who are experts on matters related to climate change. It shall report regularly to the Conference of the Parties on all aspects of its work.

2. Under the guidance of the Conference of the Parties, this body shall:

(a) Consider the information communicated in accordance with Article 12, paragraph 1, to assess the overall aggregated effect of the steps taken by the Parties in the light of the latest scientific assessments concerning climate change;

(b) Consider the information communicated in accordance with Article 12, paragraph 2, in order to assist the Conference of the Parties in carrying out the reviews required by Article 4, paragraph 2 (d); and

(c) Assist the Conference of the Parties, as appropriate, in the preparation and implementation of its decisions.

Article 11

FINANCIAL MECHANISM

1. A mechanism for the provision of financial resources on a grant or concessional basis, including for the transfer of technology, is hereby defined. It shall function under the guidance of and be accountable to the Conference of the Parties, which shall decide on its policies, programme priorities and eligibility criteria related to this Convention. Its operation shall be entrusted to one or more existing international entities.

2. The financial mechanism shall have an equitable and balanced representation of all Parties within a transparent system of governance.

3. The Conference of the Parties and the entity or entities entrusted with the operation of the financial mechanism shall agree upon arrangements to give effect to the above paragraphs, which shall include the following:

(a) Modalities to ensure that the funded projects to address climate change are in conformity with the policies, programme priorities and eligibility criteria established by the Conference of the Parties;

(b) Modalities by which a particular funding decision may be reconsidered in light of these policies, programme priorities and eligibility criteria;

(c) Provision by the entity or entities of regular reports to the Conference of the Parties on its funding operations, which is consistent with the requirement for accountability set out in paragraph 1 above; and

(d) Determination in a predictable and identifiable manner of the amount of funding necessary and available for the implementation of this Convention and the conditions under which that amount shall be periodically reviewed.

4. The Conference of the Parties shall make arrangements to implement the above-mentioned provisions at its first session, reviewing and taking into account the interim arrangements referred to in Article 21, paragraph 3, and shall decide whether these interim arrangements shall be maintained. Within four years thereafter, the Conference of the Parties shall review the financial mechanism and take appropriate measures.

5. The developed country Parties may also provide and developing country Parties avail themselves of, financial resources related to the implementation of the Convention through bilateral, regional and other multilateral channels.

Article 12

COMMUNICATION OF INFORMATION RELATED TO IMPLEMENTATION

1. In accordance with Article 4, paragraph 1, each Party shall communicate to the Conference of the Parties, through the secretariat, the following elements of information:

(a) A national inventory of anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol, to the extent its capacities permit, using comparable methodologies to be promoted and agreed upon by the Conference of the Parties;

(b) A general description of steps taken or envisaged by the Party to implement the Convention; and

(c) Any other information that the Party considers relevant to the achievement of the objective of the Convention and suitable for inclusion in its communication, including, if feasible, material relevant for calculations of global emission trends.

2. Each developed country Party and each other Party included in Annex I shall incorporate in its communication the following elements of information:

(a) A detailed description of the policies and measures that it has adopted to implement its commitment under Article 4, paragraphs 2 (a) and 2 (b); and

(b) A specific estimate of the effects that the policies and measures referred to in subparagraph (a) immediately above will have on anthropogenic emissions by its sources and removals by its sinks of greenhouse gases during the period referred to in Article 4, paragraph 2 (a).

3. In addition, each developed country Party and each other developed Party included in Annex II shall incorporate details of measures taken in accordance with Article 4, paragraphs 3, 4 and 5.

4. Developing country Parties may, on a voluntary basis, propose projects for financing, including specific technologies, materials, equipment, techniques or practices that would be needed to implement such projects, along with, if possible, an estimate of all incremental costs, of the reductions of emissions and increments of removals of greenhouse gases, as well as an estimate of the consequent benefits.

5. Each developed country Party and each other Party included in Annex I shall make its initial communication within six months of the entry into force of the Convention for that Party. Each Party not so listed shall make its initial communication within three years of the entry into force of the Convention for that Party, or of the availability of financial resources in accordance with Article 4, paragraph 3. Parties that are least developed countries may make their initial communication at their discretion. The frequency of subsequent communications by all Parties shall be determined by the Conference of the Parties, taking into account the differentiated timetable set by this paragraph.

6. Information communicated by Parties under this Article shall be transmitted by the secretariat as soon as possible to the Conference of the Parties and to any subsidiary bodies concerned. If necessary, the procedures for the communication of information may be further considered by the Conference of the Parties.

7. From its first session, the Conference of the Parties shall arrange for the provision to developing country Parties of technical and financial support, on request, in compiling and communicating information under this Article, as well as in identifying the technical and financial needs associated with proposed projects and response measures under Article 4. Such support may be provided by other Parties, by competent international organizations and by the secretariat, as appropriate.

8. Any group of Parties may, subject to guidelines adopted by the Conference of the Parties, and to prior notification to the Conference of the Parties, make a joint communication in fulfilment of their obligations under this Article, provided that such a communication includes information on the fulfilment by each of these Parties of its individual obligations under the Convention.

9. Information received by the secretariat that is designated by a Party as confidential, in accordance with criteria to be established by the Conference of the Parties, shall be aggregated by the secretariat to protect its confidentiality before being made available to any of the bodies involved in the communication and review of information.

10. Subject to paragraph 9 above, and without prejudice to the ability of any Party to make public its communication at any time, the secretariat shall make communications by Parties under this Article publicly available at the time they are submitted to the Conference of the Parties.

Article 13

RESOLUTION OF QUESTIONS REGARDING IMPLEMENTATION

The Conference of the Parties shall, at its first session, consider the establishment of a multilateral consultative process, available to Parties on their request, for the resolution of questions regarding the implementation of the Convention.

Article 14

SETTLEMENT OF DISPUTES

1. In the event of a dispute between any two or more Parties concerning the interpretation or application of the Convention, the Parties concerned shall seek a settlement of the dispute through negotiation or any other peaceful means of their own choice.

2. When ratifying, accepting, approving or acceding to the Convention, or at any time thereafter, a Party which is not a regional economic integration organization may declare in a written instrument submitted to the Depositary that, in respect of any dispute concerning the interpretation or application of the Convention, it recognizes as compulsory ipso facto and without special agreement, in relation to any Party accepting the same obligation:

(a) Submission of the dispute to the International Court of Justice; and/or

(b) Arbitration in accordance with procedures to be adopted by the Conference of the Parties as soon as practicable, in an annex on arbitration.

A Party which is a regional economic integration organization may make a declaration with like effect in relation to arbitration in accordance with the procedures referred to in subparagraph (b) above.

3. A declaration made under paragraph 2 above shall remain in force until it expires in accordance with its terms or until three months after written notice of its revocation has been deposited with the Depositary.

4. A new declaration, a notice of revocation or the expiry of a declaration shall not in any way affect proceedings pending before the International Court of Justice or the arbitral tribunal, unless the parties to the dispute otherwise agree.

5. Subject to the operation of paragraph 2 above, if after twelve months following notification by one Party to another that a dispute exists between them, the Parties concerned have not been able to settle their dispute through the means mentioned in paragraph 1 above, the dispute shall be submitted, at the request of any of the parties to the dispute, to conciliation.

6. A conciliation commission shall be created upon the request of one of the parties to the dispute. The commission shall be composed of an equal number of members appointed by each party concerned and a chairman chosen jointly by the members appointed by each party. The commission shall render a recommendatory award, which the parties shall consider in good faith.

7. Additional procedures relating to conciliation shall be adopted by the Conference of the Parties, as soon as practicable, in an annex on conciliation.

8. The provisions of this Article shall apply to any related legal instrument which the Conference of the Parties may adopt, unless the instrument provides otherwise.

Article 15

AMENDMENTS TO THE CONVENTION

1. Any Party may propose amendments to the Convention.

2. Amendments to the Convention shall be adopted at an ordinary session of the Conference of the Parties. The text of any proposed amendment to the Convention shall be communicated to the Parties by the secretariat at least six months before the meeting at which it is proposed for adoption. The secretariat shall also communicate proposed amendments to the signatories to the Convention and, for information, to the Depositary.

3. The Parties shall make every effort to reach agreement on any proposed amendment to the Convention by consensus. If all efforts at consensus have been exhausted, and no agreement reached, the amendment shall as a last resort be adopted by a three-fourths majority vote of the Parties present and voting at the meeting. The adopted amendment shall be communicated by the secretariat to the Depositary, who shall circulate it to all Parties for their acceptance.

4. Instruments of acceptance in respect of an amendment shall be deposited with the Depositary. An amendment adopted in accordance with paragraph 3 above shall enter into force for those Parties having accepted it on the ninetieth day after the date of receipt by the Depositary of an instrument of acceptance by at least three fourths of the Parties to the Convention.

5. The amendment shall enter into force for any other Party on the ninetieth day after the date on which that Party deposits with the Depositary its instrument of acceptance of the said amendment.

6. For the purposes of this Article, "Parties present and voting" means Parties present and casting an affirmative or negative vote.

Article 16

ADOPTION AND AMENDMENT OF ANNEXES TO THE CONVENTION

1. Annexes to the Convention shall form an integral part thereof and, unless otherwise expressly provided, a reference to the Convention constitutes at the same time a reference to any annexes thereto. Without prejudice to the provisions of Article 14, paragraphs 2 (b) and 7, such annexes shall be restricted to lists, forms and any other material of a descriptive nature that is of a scientific, technical, procedural or administrative character.

2. Annexes to the Convention shall be proposed and adopted in accordance with the procedure set forth in Article 15, paragraphs 2, 3 and 4.

3. An annex that has been adopted in accordance with paragraph 2 above shall enter into force for all Parties to the Convention six months after the date of the communication by the Depositary to such Parties of the adoption of the annex, except for those Parties that have notified the Depositary, in writing, within that period of their non-acceptance of the annex. The annex shall enter into force for Parties which withdraw their notification of non-acceptance on the ninetieth day after the date on which withdrawal of such notification has been received by the Depositary.

4. The proposal, adoption and entry into force of amendments to annexes to the Convention shall be subject to the same procedure as that for the proposal, adoption and entry into force of annexes to the Convention in accordance with paragraphs 2 and 3 above.

5. If the adoption of an annex or an amendment to an annex involves an amendment to the Convention, that annex or amendment to an annex shall not enter into force until such time as the amendment to the Convention enters into force.

Article 17

PROTOCOLS

1. The Conference of the Parties may, at any ordinary session, adopt protocols to the Convention.

2. The text of any proposed protocol shall be communicated to the Parties by the secretariat at least six months before such a session.

3. The requirements for the entry into force of any protocol shall be established by that instrument.

4. Only Parties to the Convention may be Parties to a protocol.

5. Decisions under any protocol shall be taken only by the Parties to the protocol concerned.

Article 18

RIGHT TO VOTE

1. Each Party to the Convention shall have one vote, except as provided for in paragraph 2 below.

2. Regional economic integration organizations, in matters within their competence, shall exercise their right to vote with a number of votes equal to the number of their member States that are Parties to the Convention. Such an organization shall not exercise its right to vote if any of its member States exercises its right, and vice versa.

Article 19

DEPOSITARY

The Secretary-General of the United Nations shall be the Depositary of the Convention and of protocols adopted in accordance with Article 17.

Article 20

SIGNATURE

This Convention shall be open for signature by States Members of the United Nations or of any of its specialized agencies or that are Parties to the Statute of the International Court of Justice and by regional economic integration organizations at Rio de Janeiro, during the United Nations Conference on Environment and Development, and thereafter at United Nations Headquarters in New York from 20 June 1992 to 19 June 1993.

Article 21

INTERIM ARRANGEMENTS

1. The secretariat functions referred to in Article 8 will be carried out on an interim basis by the secretariat established by the General Assembly of the United Nations in its resolution 45/212 of 21 December 1990, until the completion of the first session of the Conference of the Parties.

2. The head of the interim secretariat referred to in paragraph 1 above will cooperate closely with the Intergovernmental Panel on Climate Change to ensure that the Panel can respond to the need for objective scientific and technical advice. Other relevant scientific bodies could also be consulted.

3. The Global Environment Facility of the United Nations Development Programme, the United Nations Environment Programme and the International Bank for Reconstruction and Development shall be the international entity entrusted with the operation of the financial mechanism referred to in Article 11 on an interim basis. In this connection, the Global Environment Facility should be appropriately restructured and its membership made universal to enable it to fulfil the requirements of Article 11.

Article 22

RATIFICATION, ACCEPTANCE, APPROVAL OR ACCESSION

1. The Convention shall be subject to ratification, acceptance, approval or accession by States and by regional economic integration organizations. It shall be open for accession from the day after the date on which the Convention is closed for signature. Instruments of ratification, acceptance, approval or accession shall be deposited with the Depositary.

2. Any regional economic integration organization which becomes a Party to the Convention without any of its member States being a Party shall be bound by all the obligations under the Convention. In the case of such organizations, one or more of whose member States is a Party to the Convention, the organization and its member States shall decide on their respective responsibilities for the performance of their obligations under the Convention. In such cases, the organization and the member States shall not be entitled to exercise rights under the Convention concurrently.

3. In their instruments of ratification, acceptance, approval or accession, regional economic integration organizations shall declare the extent of their competence with respect to the matters governed by the Convention. These organizations shall also inform the Depositary, who shall in turn inform the Parties, of any substantial modification in the extent of their competence.

Article 23

ENTRY INTO FORCE

1. The Convention shall enter into force on the ninetieth day after the date of deposit of the fiftieth instrument of ratification, acceptance, approval or accession.

2. For each State or regional economic integration organization that ratifies, accepts or approves the Convention or accedes thereto after the deposit of the fiftieth instrument of ratification, acceptance, approval or accession, the Convention shall enter into force on the ninetieth day after the date of deposit by such State or regional economic integration organization of its instrument of ratification, acceptance, approval or accession.

3. For the purposes of paragraphs 1 and 2 above, any instrument deposited by a regional economic integration organization shall not be counted as additional to those deposited by States members of the organization.

Article 24

RESERVATIONS

No reservations may be made to the Convention.

Article 25

WITHDRAWAL

1. At any time after three years from the date on which the Convention has entered into force for a Party, that Party may withdraw from the Convention by giving written notification to the Depositary.

2. Any such withdrawal shall take effect upon expiry of one year from the date of receipt by the Depositary of the notification of withdrawal, or on such later date as may be specified in the notification of withdrawal.

3. Any Party that withdraws from the Convention shall be considered as also having withdrawn from any protocol to which it is a Party.

Article 26

AUTHENTIC TEXTS

The original of this Convention, of which the Arabic, Chinese, English, French, Russian and Spanish texts are equally authentic, shall be deposited with the Secretary-General of the United Nations.

IN WITNESS WHEREOF the undersigned, being duly authorized to that effect, have signed this Convention.

DONE at New York this ninth day of May one thousand nine hundred and ninety-two.

Annex I

Australia
Austria
Belarus[a]
Belgium
Bulgaria[a]
Canada
Croatia[a] *
Czech Republic[a] *
Denmark
European Economic Community
Estonia[a]
Finland
France
Germany
Greece
Hungary[a]
Iceland
Ireland
Italy
Japan
Latvia[a]
Liechtenstein*
Lithuania[a]
Luxembourg
Monaco*
Netherlands
New Zealand
Norway
Poland[a]
Portugal
Romania[a]
Russian Federation[a]
Slovakia[a] *
Slovenia[a] *
Spain
Sweden
Switzerland
Turkey
Ukraine[a]
United Kingdom of Great Britain and Northern Ireland
United States of America

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[a] Countries that are undergoing the process of transition to a market economy.

* *Publisher's note*: Countries added to Annex I by an amendment that entered into force on 13 August 1998, pursuant to decision 4/CP.3 adopted at COP.3.

Annex II

Australia
Austria
Belgium
Canada
Denmark
European Economic Community
Finland
France
Germany
Greece
Iceland
Ireland
Italy
Japan
Luxembourg
Netherlands
New Zealand
Norway
Portugal
Spain
Sweden
Switzerland
United Kingdom of Great Britain and Northern Ireland
United States of America

Publisher's note: Turkey was deleted from Annex II by an amendment that entered into force 28 June 2002, pursuant to decision 26/CP.7 adopted at COP.7.

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APPENDIX B

KYOTO PROTOCOL TO THE UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE

KYOTO PROTOCOL TO THE UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE

UNITED NATIONS

1998

KYOTO PROTOCOL TO THE UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE

The Parties to this Protocol,

Being Parties to the United Nations Framework Convention on Climate Change, hereinafter referred to as "the Convention",

In pursuit of the ultimate objective of the Convention as stated in its Article 2,

Recalling the provisions of the Convention,

Being guided by Article 3 of the Convention,

Pursuant to the Berlin Mandate adopted by decision 1/CP.1 of the Conference of the Parties to the Convention at its first session,

Have agreed as follows:

Article 1

For the purposes of this Protocol, the definitions contained in Article 1 of the Convention shall apply. In addition:

1. "Conference of the Parties" means the Conference of the Parties to the Convention.

2. "Convention" means the United Nations Framework Convention on Climate Change, adopted in New York on 9 May 1992.

3. "Intergovernmental Panel on Climate Change" means the Intergovernmental Panel on Climate Change established in 1988 jointly by the World Meteorological Organization and the United Nations Environment Programme.

4. "Montreal Protocol" means the Montreal Protocol on Substances that Deplete the Ozone Layer, adopted in Montreal on 16 September 1987 and as subsequently adjusted and amended.

5. "Parties present and voting" means Parties present and casting an affirmative or negative vote.

6. "Party" means, unless the context otherwise indicates, a Party to this Protocol.

7. "Party included in Annex I" means a Party included in Annex I to the Convention, as may be amended, or a Party which has made a notification under Article 4, paragraph 2 (g), of the Convention.

Article 2

1. Each Party included in Annex I, in achieving its quantified emission limitation and reduction commitments under Article 3, in order to promote sustainable development, shall:

(a) Implement and/or further elaborate policies and measures in accordance with its national circumstances, such as:

(i) Enhancement of energy efficiency in relevant sectors of the national economy;

(ii) Protection and enhancement of sinks and reservoirs of greenhouse gases not controlled by the Montreal Protocol, taking into account its commitments under relevant international environmental agreements; promotion of sustainable forest management practices, afforestation and reforestation;

(iii) Promotion of sustainable forms of agriculture in light of climate change considerations;

(iv) Research on, and promotion, development and increased use of, new and renewable forms of energy, of carbon dioxide sequestration technologies and of advanced and innovative environmentally sound technologies;

(v) Progressive reduction or phasing out of market imperfections, fiscal incentives, tax and duty exemptions and subsidies in all greenhouse gas emitting sectors that run counter to the objective of the Convention and application of market instruments;

(vi) Encouragement of appropriate reforms in relevant sectors aimed at promoting policies and measures which limit or reduce emissions of greenhouse gases not controlled by the Montreal Protocol;

(vii) Measures to limit and/or reduce emissions of greenhouse gases not controlled by the Montreal Protocol in the transport sector;

(viii) Limitation and/or reduction of methane emissions through recovery and use in waste management, as well as in the production, transport and distribution of energy;

(b) Cooperate with other such Parties to enhance the individual and combined effectiveness of their policies and measures adopted under this Article, pursuant to Article 4, paragraph 2 (e) (i), of the Convention. To this end, these Parties shall take steps to share their experience and exchange information on such policies and measures, including developing ways of improving their comparability, transparency and effectiveness. The Conference of the Parties serving as the meeting of the Parties to this Protocol shall, at its first session or as soon as practicable thereafter, consider ways to facilitate such cooperation, taking into account all relevant information.

2. The Parties included in Annex I shall pursue limitation or reduction of emissions of greenhouse gases not controlled by the Montreal Protocol from aviation and marine bunker fuels, working through the International Civil Aviation Organization and the International Maritime Organization, respectively.

3. The Parties included in Annex I shall strive to implement policies and measures under this Article in such a way as to minimize adverse effects, including the adverse effects of climate change, effects on international trade, and social, environmental and economic impacts on other Parties, especially developing country Parties and in particular those identified in Article 4, paragraphs 8 and 9, of the Convention, taking into account Article 3 of the Convention. The Conference of the Parties serving as the meeting of the Parties to this Protocol may take further action, as appropriate, to promote the implementation of the provisions of this paragraph.

4. The Conference of the Parties serving as the meeting of the Parties to this Protocol, if it decides that it would be beneficial to coordinate any of the policies and measures in paragraph 1 (a) above, taking into account different national circumstances and potential effects, shall consider ways and means to elaborate the coordination of such policies and measures.

Article 3

1. The Parties included in Annex I shall, individually or jointly, ensure that their aggregate anthropogenic carbon dioxide equivalent emissions of the greenhouse gases listed in Annex A do not exceed their assigned amounts, calculated pursuant to their quantified emission limitation and reduction commitments inscribed in Annex B and in accordance with the provisions of this Article, with a view to reducing their overall emissions of such gases by at least 5 per cent below 1990 levels in the commitment period 2008 to 2012.

2. Each Party included in Annex I shall, by 2005, have made demonstrable progress in achieving its commitments under this Protocol.

3. The net changes in greenhouse gas emissions by sources and removals by sinks resulting from direct human-induced land-use change and forestry activities, limited to afforestation, reforestation and deforestation since 1990, measured as verifiable changes in carbon stocks in each commitment period, shall be used to meet the commitments under this Article of each Party included in Annex I. The greenhouse gas emissions by sources and removals by sinks associated with those activities shall be reported in a transparent and verifiable manner and reviewed in accordance with Articles 7 and 8.

4. Prior to the first session of the Conference of the Parties serving as the meeting of the Parties to this Protocol, each Party included in Annex I shall provide, for consideration by the Subsidiary Body for Scientific and Technological Advice, data to establish its level of carbon stocks in 1990 and to enable an estimate to be made of its changes in carbon stocks in subsequent years. The Conference of the Parties serving as the meeting of the Parties to this Protocol shall, at its first session or as soon as practicable thereafter, decide upon modalities, rules and guidelines as to how, and which, additional human-induced activities related to changes in greenhouse gas emissions by sources and removals by sinks in the agricultural soils and the land-use change and forestry categories shall be added to, or subtracted from, the assigned amounts for Parties included in Annex I, taking into account uncertainties, transparency in reporting, verifiability, the methodological work of the Intergovernmental Panel on Climate Change, the advice provided by the Subsidiary Body for Scientific and Technological Advice in accordance with Article 5 and the decisions of the Conference of the Parties. Such a decision shall apply in the second and subsequent commitment periods. A Party may choose to apply such a decision on these additional human-induced activities for its first commitment period, provided that these activities have taken place since 1990.

5. The Parties included in Annex I undergoing the process of transition to a market economy whose base year or period was established pursuant to decision 9/CP.2 of the Conference of the Parties at its second session shall use that base year or period for the implementation of their commitments under this Article. Any other Party included in Annex I undergoing the process of transition to a market economy which has not yet submitted its first national communication under Article 12 of the Convention may also notify the Conference of the Parties serving as the meeting of the Parties to this Protocol that it intends to use an historical base year or period other than 1990 for the implementation of its commitments under this Article. The Conference of the Parties serving as the meeting of the Parties to this Protocol shall decide on the acceptance of such notification.

6. Taking into account Article 4, paragraph 6, of the Convention, in the implementation of their commitments under this Protocol other than those under this Article, a certain degree of flexibility shall be allowed by the Conference of the Parties serving as the meeting of the Parties to this Protocol to the Parties included in Annex I undergoing the process of transition to a market economy.

7. In the first quantified emission limitation and reduction commitment period, from 2008 to 2012, the assigned amount for each Party included in Annex I shall be equal to the percentage inscribed for it in Annex B of its aggregate anthropogenic carbon dioxide equivalent emissions of the greenhouse gases listed in Annex A in 1990, or the base year or period determined in accordance with paragraph 5 above, multiplied by five. Those Parties included in Annex I for whom land-use change and forestry constituted a net source of greenhouse gas emissions in 1990 shall include in their 1990 emissions base year or period the aggregate anthropogenic carbon dioxide equivalent emissions by sources minus removals by sinks in 1990 from land-use change for the purposes of calculating their assigned amount.

8. Any Party included in Annex I may use 1995 as its base year for hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride, for the purposes of the calculation referred to in paragraph 7 above.

9. Commitments for subsequent periods for Parties included in Annex I shall be established in amendments to Annex B to this Protocol, which shall be adopted in accordance with the provisions of Article 21, paragraph 7. The Conference of the Parties serving as the meeting of the Parties to this Protocol shall initiate the consideration of such commitments at least seven years before the end of the first commitment period referred to in paragraph 1 above.

10. Any emission reduction units, or any part of an assigned amount, which a Party acquires from another Party in accordance with the provisions of Article 6 or of Article 17 shall be added to the assigned amount for the acquiring Party.

11. Any emission reduction units, or any part of an assigned amount, which a Party transfers to another Party in accordance with the provisions of Article 6 or of Article 17 shall be subtracted from the assigned amount for the transferring Party.

12. Any certified emission reductions which a Party acquires from another Party in accordance with the provisions of Article 12 shall be added to the assigned amount for the acquiring Party.

13. If the emissions of a Party included in Annex I in a commitment period are less than its assigned amount under this Article, this difference shall, on request of that Party, be added to the assigned amount for that Party for subsequent commitment periods.

14. Each Party included in Annex I shall strive to implement the commitments mentioned in paragraph 1 above in such a way as to minimize adverse social, environmental and economic impacts on developing country Parties, particularly those identified in Article 4, paragraphs 8 and 9, of the Convention. In line with relevant decisions of the Conference of the Parties on the implementation of those paragraphs, the Conference of the Parties serving as the meeting of the Parties to this Protocol shall, at its first session, consider what actions are necessary to minimize the adverse effects of climate change and/or the impacts of response measures on Parties referred to in those paragraphs. Among the issues to be considered shall be the establishment of funding, insurance and transfer of technology.

Article 4

1. Any Parties included in Annex I that have reached an agreement to fulfil their commitments under Article 3 jointly, shall be deemed to have met those commitments provided that their total combined aggregate anthropogenic carbon dioxide equivalent emissions of the greenhouse gases listed in Annex A do not exceed their assigned amounts calculated pursuant to their quantified emission limitation and reduction commitments inscribed in Annex B and in accordance with the provisions of Article 3. The respective emission level allocated to each of the Parties to the agreement shall be set out in that agreement.

2. The Parties to any such agreement shall notify the secretariat of the terms of the agreement on the date of deposit of their instruments of ratification, acceptance or approval of this Protocol, or accession thereto. The secretariat shall in turn inform the Parties and signatories to the Convention of the terms of the agreement.

3. Any such agreement shall remain in operation for the duration of the commitment period specified in Article 3, paragraph 7.

4. If Parties acting jointly do so in the framework of, and together with, a regional economic integration organization, any alteration in the composition of the organization after adoption of this Protocol shall not affect existing commitments under this Protocol. Any alteration in the composition of the organization shall only apply for the purposes of those commitments under Article 3 that are adopted subsequent to that alteration.

5. In the event of failure by the Parties to such an agreement to achieve their total combined level of emission reductions, each Party to that agreement shall be responsible for its own level of emissions set out in the agreement.

6. If Parties acting jointly do so in the framework of, and together with, a regional economic integration organization which is itself a Party to this Protocol, each member State of that regional economic integration organization individually, and together with the regional economic integration organization acting in accordance with Article 24, shall, in the event of failure to achieve the total combined level of emission reductions, be responsible for its level of emissions as notified in accordance with this Article.

Article 5

1. Each Party included in Annex I shall have in place, no later than one year prior to the start of the first commitment period, a national system for the estimation of anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol. Guidelines for such national systems, which shall incorporate the methodologies specified in paragraph 2 below, shall be decided upon by the Conference of the Parties serving as the meeting of the Parties to this Protocol at its first session.

2. Methodologies for estimating anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol shall be those accepted by the Intergovernmental Panel on Climate Change and agreed upon by the Conference of the Parties at its third session. Where such methodologies are not used, appropriate adjustments shall be applied according to methodologies agreed upon by the Conference of the Parties serving as the meeting of the Parties to this Protocol at its first session. Based on the work of, *inter alia*, the Intergovernmental Panel on Climate Change and advice provided by the Subsidiary Body for Scientific and Technological Advice, the Conference of the Parties serving as the meeting of the Parties to this Protocol shall regularly review and, as appropriate, revise such methodologies and adjustments, taking fully into account any relevant decisions by the Conference of the Parties. Any revision to methodologies or adjustments shall be used only for the purposes of ascertaining compliance with commitments under Article 3 in respect of any commitment period adopted subsequent to that revision.

3. The global warming potentials used to calculate the carbon dioxide equivalence of anthropogenic emissions by sources and removals by sinks of greenhouse gases listed in Annex A shall be those accepted by the Intergovernmental Panel on Climate Change and agreed upon by the Conference of the Parties at its third session. Based on the work of, *inter alia*, the Intergovernmental Panel on Climate Change and advice provided by the Subsidiary Body for Scientific and Technological Advice, the Conference of the Parties serving as the meeting of the Parties to this Protocol shall regularly review and, as appropriate, revise the global warming potential of each such greenhouse gas, taking fully into account any relevant decisions by the Conference of the Parties. Any revision to a global warming potential shall apply only to commitments under Article 3 in respect of any commitment period adopted subsequent to that revision.

Article 6

1. For the purpose of meeting its commitments under Article 3, any Party included in Annex I may transfer to, or acquire from, any other such Party emission reduction units resulting from projects aimed at reducing anthropogenic emissions by sources or enhancing anthropogenic removals by sinks of greenhouse gases in any sector of the economy, provided that:

(a) Any such project has the approval of the Parties involved;

(b) Any such project provides a reduction in emissions by sources, or an enhancement of removals by sinks, that is additional to any that would otherwise occur;

(c) It does not acquire any emission reduction units if it is not in compliance with its obligations under Articles 5 and 7; and

(d) The acquisition of emission reduction units shall be supplemental to domestic actions for the purposes of meeting commitments under Article 3.

2. The Conference of the Parties serving as the meeting of the Parties to this Protocol may, at its first session or as soon as practicable thereafter, further elaborate guidelines for the implementation of this Article, including for verification and reporting.

3. A Party included in Annex I may authorize legal entities to participate, under its responsibility, in actions leading to the generation, transfer or acquisition under this Article of emission reduction units.

4. If a question of implementation by a Party included in Annex I of the requirements referred to in this Article is identified in accordance with the relevant provisions of Article 8, transfers and acquisitions of emission reduction units may continue to be made after the question has been identified, provided that any such units may not be used by a Party to meet its commitments under Article 3 until any issue of compliance is resolved.

Article 7

1. Each Party included in Annex I shall incorporate in its annual inventory of anthropogenic emissions by sources and removals by sinks of greenhouse gases not controlled by the Montreal Protocol, submitted in accordance with the relevant decisions of the Conference of the Parties, the necessary supplementary information for the purposes of ensuring compliance with Article 3, to be determined in accordance with paragraph 4 below.

2. Each Party included in Annex I shall incorporate in its national communication, submitted under Article 12 of the Convention, the supplementary information necessary to demonstrate compliance with its commitments under this Protocol, to be determined in accordance with paragraph 4 below.

3. Each Party included in Annex I shall submit the information required under paragraph 1 above annually, beginning with the first inventory due under the Convention for the first year of the commitment period after this Protocol has entered into force for that Party. Each such Party shall submit the information required under paragraph 2 above as part of the first national communication due under the Convention after this Protocol has entered into force for it and after the adoption of guidelines as provided for in paragraph 4 below. The frequency of subsequent submission of information required under this Article shall be determined by the Conference of the Parties serving as the meeting of the Parties to this Protocol, taking into account any timetable for the submission of national communications decided upon by the Conference of the Parties.

4. The Conference of the Parties serving as the meeting of the Parties to this Protocol shall adopt at its first session, and review periodically thereafter, guidelines for the preparation of the information required under this Article, taking into account guidelines for the preparation of

national communications by Parties included in Annex I adopted by the Conference of the Parties. The Conference of the Parties serving as the meeting of the Parties to this Protocol shall also, prior to the first commitment period, decide upon modalities for the accounting of assigned amounts.

Article 8

1. The information submitted under Article 7 by each Party included in Annex I shall be reviewed by expert review teams pursuant to the relevant decisions of the Conference of the Parties and in accordance with guidelines adopted for this purpose by the Conference of the Parties serving as the meeting of the Parties to this Protocol under paragraph 4 below. The information submitted under Article 7, paragraph 1, by each Party included in Annex I shall be reviewed as part of the annual compilation and accounting of emissions inventories and assigned amounts. Additionally, the information submitted under Article 7, paragraph 2, by each Party included in Annex I shall be reviewed as part of the review of communications.

2. Expert review teams shall be coordinated by the secretariat and shall be composed of experts selected from those nominated by Parties to the Convention and, as appropriate, by intergovernmental organizations, in accordance with guidance provided for this purpose by the Conference of the Parties.

3. The review process shall provide a thorough and comprehensive technical assessment of all aspects of the implementation by a Party of this Protocol. The expert review teams shall prepare a report to the Conference of the Parties serving as the meeting of the Parties to this Protocol, assessing the implementation of the commitments of the Party and identifying any potential problems in, and factors influencing, the fulfilment of commitments. Such reports shall be circulated by the secretariat to all Parties to the Convention. The secretariat shall list those questions of implementation indicated in such reports for further consideration by the Conference of the Parties serving as the meeting of the Parties to this Protocol.

4. The Conference of the Parties serving as the meeting of the Parties to this Protocol shall adopt at its first session, and review periodically thereafter, guidelines for the review of implementation of this Protocol by expert review teams taking into account the relevant decisions of the Conference of the Parties.

5. The Conference of the Parties serving as the meeting of the Parties to this Protocol shall, with the assistance of the Subsidiary Body for Implementation and, as appropriate, the Subsidiary Body for Scientific and Technological Advice, consider:

(a) The information submitted by Parties under Article 7 and the reports of the expert reviews thereon conducted under this Article; and

(b) Those questions of implementation listed by the secretariat under paragraph 3 above, as well as any questions raised by Parties.

6. Pursuant to its consideration of the information referred to in paragraph 5 above, the Conference of the Parties serving as the meeting of the Parties to this Protocol shall take decisions on any matter required for the implementation of this Protocol.

Article 9

1. The Conference of the Parties serving as the meeting of the Parties to this Protocol shall periodically review this Protocol in the light of the best available scientific information and assessments on climate change and its impacts, as well as relevant technical, social and economic information. Such reviews shall be coordinated with pertinent reviews under the Convention, in particular those required by Article 4, paragraph 2 (d), and Article 7, paragraph 2 (a), of the Convention. Based on these reviews, the Conference of the Parties serving as the meeting of the Parties to this Protocol shall take appropriate action.

2. The first review shall take place at the second session of the Conference of the Parties serving as the meeting of the Parties to this Protocol. Further reviews shall take place at regular intervals and in a timely manner.

Article 10

All Parties, taking into account their common but differentiated responsibilities and their specific national and regional development priorities, objectives and circumstances, without introducing any new commitments for Parties not included in Annex I, but reaffirming existing commitments under Article 4, paragraph 1, of the Convention, and continuing to advance the implementation of these commitments in order to achieve sustainable development, taking into account Article 4, paragraphs 3, 5 and 7, of the Convention, shall:

(a) Formulate, where relevant and to the extent possible, cost-effective national and, where appropriate, regional programmes to improve the quality of local emission factors, activity data and/or models which reflect the socio-economic conditions of each Party for the preparation and periodic updating of national inventories of anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol, using comparable methodologies to be agreed upon by the Conference of the Parties, and consistent with the guidelines for the preparation of national communications adopted by the Conference of the Parties;

(b) Formulate, implement, publish and regularly update national and, where appropriate, regional programmes containing measures to mitigate climate change and measures to facilitate adequate adaptation to climate change:

(i) Such programmes would, *inter alia*, concern the energy, transport and industry sectors as well as agriculture, forestry and waste management. Furthermore, adaptation technologies and methods for improving spatial planning would improve adaptation to climate change; and

(ii) Parties included in Annex I shall submit information on action under this Protocol, including national programmes, in accordance with Article 7; and other Parties shall seek to include in their national communications, as appropriate, information on programmes which contain measures that the Party believes contribute to addressing climate change and its adverse impacts, including the abatement of increases in greenhouse gas emissions, and enhancement of and removals by sinks, capacity building and adaptation measures;

(c) Cooperate in the promotion of effective modalities for the development, application and diffusion of, and take all practicable steps to promote, facilitate and finance, as appropriate, the transfer of, or access to, environmentally sound technologies, know-how, practices and processes pertinent to climate change, in particular to developing countries, including the formulation of policies and programmes for the effective transfer of environmentally sound technologies that are publicly owned or in the public domain and the creation of an enabling environment for the private sector, to promote and enhance the transfer of, and access to, environmentally sound technologies;

(d) Cooperate in scientific and technical research and promote the maintenance and the development of systematic observation systems and development of data archives to reduce uncertainties related to the climate system, the adverse impacts of climate change and the economic and social consequences of various response strategies, and promote the development and strengthening of endogenous capacities and capabilities to participate in international and intergovernmental efforts, programmes and networks on research and systematic observation, taking into account Article 5 of the Convention;

(e) Cooperate in and promote at the international level, and, where appropriate, using existing bodies, the development and implementation of education and training programmes, including the strengthening of national capacity building, in particular human and institutional capacities and the exchange or secondment of personnel to train experts in this field, in particular for developing countries, and facilitate at the national level public awareness of, and public access to information on, climate change. Suitable modalities should be developed to implement these activities through the relevant bodies of the Convention, taking into account Article 6 of the Convention;

(f) Include in their national communications information on programmes and activities undertaken pursuant to this Article in accordance with relevant decisions of the Conference of the Parties; and

(g) Give full consideration, in implementing the commitments under this Article, to Article 4, paragraph 8, of the Convention.

Article 11

1. In the implementation of Article 10, Parties shall take into account the provisions of Article 4, paragraphs 4, 5, 7, 8 and 9, of the Convention.

2. In the context of the implementation of Article 4, paragraph 1, of the Convention, in accordance with the provisions of Article 4, paragraph 3, and Article 11 of the Convention, and through the entity or entities entrusted with the operation of the financial mechanism of the Convention, the developed country Parties and other developed Parties included in Annex II to the Convention shall:

(a) Provide new and additional financial resources to meet the agreed full costs incurred by developing country Parties in advancing the implementation of existing commitments under Article 4, paragraph 1 (a), of the Convention that are covered in Article 10, subparagraph (a); and

(b) Also provide such financial resources, including for the transfer of technology, needed by the developing country Parties to meet the agreed full incremental costs of advancing the implementation of existing commitments under Article 4, paragraph 1, of the Convention that are covered by Article 10 and that are agreed between a developing country Party and the international entity or entities referred to in Article 11 of the Convention, in accordance with that Article.

The implementation of these existing commitments shall take into account the need for adequacy and predictability in the flow of funds and the importance of appropriate burden sharing among developed country Parties. The guidance to the entity or entities entrusted with the operation of the financial mechanism of the Convention in relevant decisions of the Conference of the Parties, including those agreed before the adoption of this Protocol, shall apply *mutatis mutandis* to the provisions of this paragraph.

3. The developed country Parties and other developed Parties in Annex II to the Convention may also provide, and developing country Parties avail themselves of, financial resources for the implementation of Article 10, through bilateral, regional and other multilateral channels.

Article 12

1. A clean development mechanism is hereby defined.

2. The purpose of the clean development mechanism shall be to assist Parties not included in Annex I in achieving sustainable development and in contributing to the ultimate objective of the Convention, and to assist Parties included in Annex I in achieving compliance with their quantified emission limitation and reduction commitments under Article 3.

3. Under the clean development mechanism:

(a) Parties not included in Annex I will benefit from project activities resulting in certified emission reductions; and

(b) Parties included in Annex I may use the certified emission reductions accruing from such project activities to contribute to compliance with part of their quantified emission limitation and reduction commitments under Article 3, as determined by the Conference of the Parties serving as the meeting of the Parties to this Protocol.

4. The clean development mechanism shall be subject to the authority and guidance of the Conference of the Parties serving as the meeting of the Parties to this Protocol and be supervised by an executive board of the clean development mechanism.

5. Emission reductions resulting from each project activity shall be certified by operational entities to be designated by the Conference of the Parties serving as the meeting of the Parties to this Protocol, on the basis of:

(a) Voluntary participation approved by each Party involved;

(b) Real, measurable, and long-term benefits related to the mitigation of climate change; and

(c) Reductions in emissions that are additional to any that would occur in the absence of the certified project activity.

6. The clean development mechanism shall assist in arranging funding of certified project activities as necessary.

7. The Conference of the Parties serving as the meeting of the Parties to this Protocol shall, at its first session, elaborate modalities and procedures with the objective of ensuring transparency, efficiency and accountability through independent auditing and verification of project activities.

8. The Conference of the Parties serving as the meeting of the Parties to this Protocol shall ensure that a share of the proceeds from certified project activities is used to cover administrative expenses as well as to assist developing country Parties that are particularly vulnerable to the adverse effects of climate change to meet the costs of adaptation.

9. Participation under the clean development mechanism, including in activities mentioned in paragraph 3 (a) above and in the acquisition of certified emission reductions, may involve private and/or public entities, and is to be subject to whatever guidance may be provided by the executive board of the clean development mechanism.

10. Certified emission reductions obtained during the period from the year 2000 up to the beginning of the first commitment period can be used to assist in achieving compliance in the first commitment period.

Article 13

1. The Conference of the Parties, the supreme body of the Convention, shall serve as the meeting of the Parties to this Protocol.

2. Parties to the Convention that are not Parties to this Protocol may participate as observers in the proceedings of any session of the Conference of the Parties serving as the meeting of the Parties to this Protocol. When the Conference of the Parties serves as the meeting of the Parties to this Protocol, decisions under this Protocol shall be taken only by those that are Parties to this Protocol.

3. When the Conference of the Parties serves as the meeting of the Parties to this Protocol, any member of the Bureau of the Conference of the Parties representing a Party to the Convention but, at that time, not a Party to this Protocol, shall be replaced by an additional member to be elected by and from amongst the Parties to this Protocol.

4. The Conference of the Parties serving as the meeting of the Parties to this Protocol shall keep under regular review the implementation of this Protocol and shall make, within its mandate, the decisions necessary to promote its effective implementation. It shall perform the functions assigned to it by this Protocol and shall:

(a) Assess, on the basis of all information made available to it in accordance with the provisions of this Protocol, the implementation of this Protocol by the Parties, the overall effects of the measures taken pursuant to this Protocol, in particular environmental, economic and social effects as well as their cumulative impacts and the extent to which progress towards the objective of the Convention is being achieved;

(b) Periodically examine the obligations of the Parties under this Protocol, giving due consideration to any reviews required by Article 4, paragraph 2 (d), and Article 7, paragraph 2, of the Convention, in the light of the objective of the Convention, the experience gained in its implementation and the evolution of scientific and technological knowledge, and in this respect consider and adopt regular reports on the implementation of this Protocol;

(c) Promote and facilitate the exchange of information on measures adopted by the Parties to address climate change and its effects, taking into account the differing circumstances, responsibilities and capabilities of the Parties and their respective commitments under this Protocol;

(d) Facilitate, at the request of two or more Parties, the coordination of measures adopted by them to address climate change and its effects, taking into account the differing circumstances, responsibilities and capabilities of the Parties and their respective commitments under this Protocol;

(e) Promote and guide, in accordance with the objective of the Convention and the provisions of this Protocol, and taking fully into account the relevant decisions by the Conference of the Parties, the development and periodic refinement of comparable methodologies for the effective implementation of this Protocol, to be agreed on by the Conference of the Parties serving as the meeting of the Parties to this Protocol;

(f) Make recommendations on any matters necessary for the implementation of this Protocol;

(g) Seek to mobilize additional financial resources in accordance with Article 11, paragraph 2;

(h) Establish such subsidiary bodies as are deemed necessary for the implementation of this Protocol;

(i) Seek and utilize, where appropriate, the services and cooperation of, and information provided by, competent international organizations and intergovernmental and non-governmental bodies; and

(j) Exercise such other functions as may be required for the implementation of this Protocol, and consider any assignment resulting from a decision by the Conference of the Parties.

5. The rules of procedure of the Conference of the Parties and financial procedures applied under the Convention shall be applied *mutatis mutandis* under this Protocol, except as may be otherwise decided by consensus by the Conference of the Parties serving as the meeting of the Parties to this Protocol.

6. The first session of the Conference of the Parties serving as the meeting of the Parties to this Protocol shall be convened by the secretariat in conjunction with the first session of the Conference of the Parties that is scheduled after the date of the entry into force of this Protocol. Subsequent ordinary sessions of the Conference of the Parties serving as the meeting of the Parties to this Protocol shall be held every year and in conjunction with ordinary sessions of the Conference of the Parties, unless otherwise decided by the Conference of the Parties serving as the meeting of the Parties to this Protocol.

7. Extraordinary sessions of the Conference of the Parties serving as the meeting of the Parties to this Protocol shall be held at such other times as may be deemed necessary by the Conference of the Parties serving as the meeting of the Parties to this Protocol, or at the written request of any Party, provided that, within six months of the request being communicated to the Parties by the secretariat, it is supported by at least one third of the Parties.

8. The United Nations, its specialized agencies and the International Atomic Energy Agency, as well as any State member thereof or observers thereto not party to the Convention, may be represented at sessions of the Conference of the Parties serving as the meeting of the Parties to this Protocol as observers. Any body or agency, whether national or international, governmental or non-governmental, which is qualified in matters covered by this Protocol and which has informed the secretariat of its wish to be represented at a session of the Conference of the Parties serving as the meeting of the Parties to this Protocol as an observer, may be so admitted unless at least one third of the Parties present object. The admission and participation of observers shall be subject to the rules of procedure, as referred to in paragraph 5 above.

Article 14

1. The secretariat established by Article 8 of the Convention shall serve as the secretariat of this Protocol.

2. Article 8, paragraph 2, of the Convention on the functions of the secretariat, and Article 8, paragraph 3, of the Convention on arrangements made for the functioning of the secretariat, shall apply *mutatis mutandis* to this Protocol. The secretariat shall, in addition, exercise the functions assigned to it under this Protocol.

Article 15

1. The Subsidiary Body for Scientific and Technological Advice and the Subsidiary Body for Implementation established by Articles 9 and 10 of the Convention shall serve as, respectively, the Subsidiary Body for Scientific and Technological Advice and the Subsidiary Body for Implementation of this Protocol. The provisions relating to the functioning of these two bodies under the Convention shall apply *mutatis mutandis* to this Protocol. Sessions of the meetings of the Subsidiary Body for Scientific and Technological Advice and the Subsidiary Body for Implementation of this Protocol shall be held in conjunction with the meetings of, respectively, the Subsidiary Body for Scientific and Technological Advice and the Subsidiary Body for Implementation of the Convention.

2. Parties to the Convention that are not Parties to this Protocol may participate as observers in the proceedings of any session of the subsidiary bodies. When the subsidiary bodies serve as the subsidiary bodies of this Protocol, decisions under this Protocol shall be taken only by those that are Parties to this Protocol.

3. When the subsidiary bodies established by Articles 9 and 10 of the Convention exercise their functions with regard to matters concerning this Protocol, any member of the Bureaux of those subsidiary bodies representing a Party to the Convention but, at that time, not a party to this Protocol, shall be replaced by an additional member to be elected by and from amongst the Parties to this Protocol.

Article 16

The Conference of the Parties serving as the meeting of the Parties to this Protocol shall, as soon as practicable, consider the application to this Protocol of, and modify as appropriate, the multilateral consultative process referred to in Article 13 of the Convention, in the light of any relevant decisions that may be taken by the Conference of the Parties. Any multilateral consultative process that may be applied to this Protocol shall operate without prejudice to the procedures and mechanisms established in accordance with Article 18.

Article 17

The Conference of the Parties shall define the relevant principles, modalities, rules and guidelines, in particular for verification, reporting and accountability for emissions trading. The Parties included in Annex B may participate in emissions trading for the purposes of fulfilling their commitments under Article 3. Any such trading shall be supplemental to domestic actions for the purpose of meeting quantified emission limitation and reduction commitments under that Article.

Article 18

The Conference of the Parties serving as the meeting of the Parties to this Protocol shall, at its first session, approve appropriate and effective procedures and mechanisms to determine and to address cases of non-compliance with the provisions of this Protocol, including through the development of an indicative list of consequences, taking into account the cause, type, degree and frequency of non-compliance. Any procedures and mechanisms under this Article entailing binding consequences shall be adopted by means of an amendment to this Protocol.

Article 19

The provisions of Article 14 of the Convention on settlement of disputes shall apply *mutatis mutandis* to this Protocol.

Article 20

1. Any Party may propose amendments to this Protocol.

2. Amendments to this Protocol shall be adopted at an ordinary session of the Conference of the Parties serving as the meeting of the Parties to this Protocol. The text of any proposed amendment to this Protocol shall be communicated to the Parties by the secretariat at least

six months before the meeting at which it is proposed for adoption. The secretariat shall also communicate the text of any proposed amendments to the Parties and signatories to the Convention and, for information, to the Depositary.

3. The Parties shall make every effort to reach agreement on any proposed amendment to this Protocol by consensus. If all efforts at consensus have been exhausted, and no agreement reached, the amendment shall as a last resort be adopted by a three-fourths majority vote of the Parties present and voting at the meeting. The adopted amendment shall be communicated by the secretariat to the Depositary, who shall circulate it to all Parties for their acceptance.

4. Instruments of acceptance in respect of an amendment shall be deposited with the Depositary. An amendment adopted in accordance with paragraph 3 above shall enter into force for those Parties having accepted it on the ninetieth day after the date of receipt by the Depositary of an instrument of acceptance by at least three fourths of the Parties to this Protocol.

5. The amendment shall enter into force for any other Party on the ninetieth day after the date on which that Party deposits with the Depositary its instrument of acceptance of the said amendment.

Article 21

1. Annexes to this Protocol shall form an integral part thereof and, unless otherwise expressly provided, a reference to this Protocol constitutes at the same time a reference to any annexes thereto. Any annexes adopted after the entry into force of this Protocol shall be restricted to lists, forms and any other material of a descriptive nature that is of a scientific, technical, procedural or administrative character.

2. Any Party may make proposals for an annex to this Protocol and may propose amendments to annexes to this Protocol.

3. Annexes to this Protocol and amendments to annexes to this Protocol shall be adopted at an ordinary session of the Conference of the Parties serving as the meeting of the Parties to this Protocol. The text of any proposed annex or amendment to an annex shall be communicated to the Parties by the secretariat at least six months before the meeting at which it is proposed for adoption. The secretariat shall also communicate the text of any proposed annex or amendment to an annex to the Parties and signatories to the Convention and, for information, to the Depositary.

4. The Parties shall make every effort to reach agreement on any proposed annex or amendment to an annex by consensus. If all efforts at consensus have been exhausted, and no agreement reached, the annex or amendment to an annex shall as a last resort be adopted by a three-fourths majority vote of the Parties present and voting at the meeting. The adopted annex or amendment to an annex shall be communicated by the secretariat to the Depositary, who shall circulate it to all Parties for their acceptance.

5. An annex, or amendment to an annex other than Annex A or B, that has been adopted in accordance with paragraphs 3 and 4 above shall enter into force for all Parties to this Protocol six months after the date of the communication by the Depositary to such Parties of the adoption of the annex or adoption of the amendment to the annex, except for those Parties that have

notified the Depositary, in writing, within that period of their non-acceptance of the annex or amendment to the annex. The annex or amendment to an annex shall enter into force for Parties which withdraw their notification of non-acceptance on the ninetieth day after the date on which withdrawal of such notification has been received by the Depositary.

6. If the adoption of an annex or an amendment to an annex involves an amendment to this Protocol, that annex or amendment to an annex shall not enter into force until such time as the amendment to this Protocol enters into force.

7. Amendments to Annexes A and B to this Protocol shall be adopted and enter into force in accordance with the procedure set out in Article 20, provided that any amendment to Annex B shall be adopted only with the written consent of the Party concerned.

Article 22

1. Each Party shall have one vote, except as provided for in paragraph 2 below.

2. Regional economic integration organizations, in matters within their competence, shall exercise their right to vote with a number of votes equal to the number of their member States that are Parties to this Protocol. Such an organization shall not exercise its right to vote if any of its member States exercises its right, and vice versa.

Article 23

The Secretary-General of the United Nations shall be the Depositary of this Protocol.

Article 24

1. This Protocol shall be open for signature and subject to ratification, acceptance or approval by States and regional economic integration organizations which are Parties to the Convention. It shall be open for signature at United Nations Headquarters in New York from 16 March 1998 to 15 March 1999. This Protocol shall be open for accession from the day after the date on which it is closed for signature. Instruments of ratification, acceptance, approval or accession shall be deposited with the Depositary.

2. Any regional economic integration organization which becomes a Party to this Protocol without any of its member States being a Party shall be bound by all the obligations under this Protocol. In the case of such organizations, one or more of whose member States is a Party to this Protocol, the organization and its member States shall decide on their respective responsibilities for the performance of their obligations under this Protocol. In such cases, the organization and the member States shall not be entitled to exercise rights under this Protocol concurrently.

3. In their instruments of ratification, acceptance, approval or accession, regional economic integration organizations shall declare the extent of their competence with respect to the matters governed by this Protocol. These organizations shall also inform the Depositary, who shall in turn inform the Parties, of any substantial modification in the extent of their competence.

Article 25

1. This Protocol shall enter into force on the ninetieth day after the date on which not less than 55 Parties to the Convention, incorporating Parties included in Annex I which accounted in total for at least 55 per cent of the total carbon dioxide emissions for 1990 of the Parties included in Annex I, have deposited their instruments of ratification, acceptance, approval or accession.

2. For the purposes of this Article, "the total carbon dioxide emissions for 1990 of the Parties included in Annex I" means the amount communicated on or before the date of adoption of this Protocol by the Parties included in Annex I in their first national communications submitted in accordance with Article 12 of the Convention.

3. For each State or regional economic integration organization that ratifies, accepts or approves this Protocol or accedes thereto after the conditions set out in paragraph 1 above for entry into force have been fulfilled, this Protocol shall enter into force on the ninetieth day following the date of deposit of its instrument of ratification, acceptance, approval or accession.

4. For the purposes of this Article, any instrument deposited by a regional economic integration organization shall not be counted as additional to those deposited by States members of the organization.

Article 26

No reservations may be made to this Protocol.

Article 27

1. At any time after three years from the date on which this Protocol has entered into force for a Party, that Party may withdraw from this Protocol by giving written notification to the Depositary.

2. Any such withdrawal shall take effect upon expiry of one year from the date of receipt by the Depositary of the notification of withdrawal, or on such later date as may be specified in the notification of withdrawal.

3. Any Party that withdraws from the Convention shall be considered as also having withdrawn from this Protocol.

Article 28

The original of this Protocol, of which the Arabic, Chinese, English, French, Russian and Spanish texts are equally authentic, shall be deposited with the Secretary-General of the United Nations.

DONE at Kyoto this eleventh day of December one thousand nine hundred and ninety-seven.

IN WITNESS WHEREOF the undersigned, being duly authorized to that effect, have affixed their signatures to this Protocol on the dates indicated.

Annex A

Greenhouse gases

Carbon dioxide (C02)
Methane (CH4)
Nitrous oxide (N20)
Hydrofluorocarbons (HFCs)
Perfluorocarbons (PFCs)
Sulphur hexafluoride (SF6)

Sectors/source categories

Energy

- Fuel combustion
  - Energy industries
  - Manufacturing industries and construction
  - Transport
  - Other sectors
  - Other
- Fugitive emissions from fuels
  - Solid fuels
  - Oil and natural gas
  - Other

Industrial processes

- Mineral products
- Chemical industry
- Metal production
- Other production
- Production of halocarbons and sulphur hexafluoride
- Consumption of halocarbons and sulphur hexafluoride
- Other

Solvent and other product use

Agriculture

- Enteric fermentation
- Manure management
- Rice cultivation
- Agricultural soils
- Prescribed burning of savannas
- Field burning of agricultural residues
- Other

Waste

- Solid waste disposal on land
- Wastewater handling
- Waste incineration
- Other

Annex B

Party	Quantified emission limitation or reduction commitment (percentage of base year or period)
Australia	108
Austria	92
Belgium	92
Bulgaria*	92
Canada	94
Croatia*	95
Czech Republic*	92
Denmark	92
Estonia*	92
European Community	92
Finland	92
France	92
Germany	92
Greece	92
Hungary*	94
Iceland	110
Ireland	92
Italy	92
Japan	94
Latvia*	92
Liechtenstein	92
Lithuania*	92
Luxembourg	92
Monaco	92
Netherlands	92
New Zealand	100
Norway	101
Poland*	94
Portugal	92
Romania*	92
Russian Federation*	100
Slovakia*	92
Slovenia*	92
Spain	92
Sweden	92
Switzerland	92
Ukraine*	100
United Kingdom of Great Britain and Northern Ireland	92
United States of America	93

* Countries that are undergoing the process of transition to a market economy.

APPENDIX C

TRANSCRIPT OF INTERVIEWS

Interview 1

Name: Professor Dr. Khairulmaini bin Osman Salleh, University of Malaya Centre for Climate Change Affairs

Date: 17th February 2009

Location: Department of Geography, Faculty of Arts and Social Sciences, University of Malaya, Kuala Lumpur.

1. How serious is the global climate change situation?

   It is getting worse. The effect of climate change is very apparent now.

2. What is the situation in Malaysia?

   It is getting worse. The unpredictable weather today is one sign of climate change.

3. Has Malaysia experienced any change in the climate lately?

   Yes they have - The unpredictable weather.

4. What are the main contributors of climate change in Malaysia?

   Cars, deforestation, open burning etc.

5. What has Malaysia done so far to mitigate the effect of climate change?

   There are some positive measures taken by the Government so far.

6. What can Malaysia do on its part to reduce the rate of climate change?

   Actions can be brought from three main aspects, namely mitigation, science and adaptability.

Interview 2

Name: Ms. Radin Diana R. Ahmad and Ms. Noorly Akmar Ramli, Research Officers from the Policy Analysis and Research Management of Malaysia Energy Centre

Date: 19th of February, 2009

Location: Malaysia Energy Centre, Bangi.

1) What is the role of the Malaysia Energy Centre?

   This can be referred to in the CDM handbook.

2) How does the Malaysia Energy Centre promote CDM?

   This can be referred to in the CDM handbook.

3) What types of projects qualify as CDM in Malaysia?

   Energy, agriculture and forestry.

4) Which is the most popular?

   Energy.

5) How many applicants have there been for the CDM projects since 2002?

   151

6) How many have been registered?

   In 2008, there have been 50 applicants. Out of these 50 applicants, 27 were registered with the Executive Board and have the CDM status and have started the project.

7) How many companies have issued with the CER (Certified Emissions Reduction)?

   6

8) How many have been registered but did not pursue with the issuance of CER?

   In the agriculture sector, there have been 10 registrations but there has not been any issuance of CER so far.

9) Where are most of the foreign partners from?

Netherlands, Japan and the UK.

10) How long does it take to process one application?

3 – 4 months.

11) How is the response so far?

This Centre has been creating awareness about CDM in Malaysia since 2002. This was done by having various workshops especially with Tenaga Nasional Berhad (National Electricity Board) and FELDA. This was done until 2006. As a result, there was a lot of applications for the CDM projects. However, the number of the applications for 2009 has been very low i.e. only one.

12) How successful is Malaysia in CDM compared to Thailand and Indonesia?

In terms of percentage, Malaysia is on par if not slightly higher compared to Thailand and Indonesia.

Interview 3

Name: Ms. Siti Khadijah Abdul Ghani, the Assistant Secretary from the Environmental Management and Conservation Division, Ministry of Natural Resources and Environment (NRE)

Date: 26th of February 2009

Location: Ministry of Natural Resources and Environment, Putrajaya

1) What Malaysia has done so far in relation to CDM?

   Malaysia has taken a lot of positive actions, namely the formation of the Malaysia Energy Centre which overlooks the CDM projects.

2) In your opinion what possible actions can Malaysia take in relation to CDM?

   Malaysia is in the midst of producing a climate change policy and this is a very positive step.

Interview 4

Name: Mr. Gurmit Singh, Environmental Protection Society Malaysia Advisor and Founder President

Date: 17th March 2009

Location: no. 17 Jalan SS2/53, Petaling Jaya, Selangor.

1) Do you agree that any action taken should focus on three main strategies - mitigation, science and vulnerability (adaptability)?

Yes. Out of these three, mitigating action is the most important which includes reducing the carbon emission level in the country. This can be done by improving the public transport, new laws and looking for alternative energy. In terms of science, Malaysia does not do any fundamental research on climate change. Our sources are very fragmented. It is difficult to get data. Furthermore, it requires a lot of investment in terms of money. Malaysia is not in a position to do fundamental research on climate change because it is difficult to get data on climate change and it requires a lot of money for computers and special software to do so. A better approach would be to collect data on a smaller scale that is at a micro level of the country because currently most data available in a large scale. In terms of adaptability, the change will be there. Action must be taken here especially to ascertain which sector has changed. Obviously, it is energy but which one. Transportation is the easiest to change but the most difficult. Fuel is used most in transportation. Another is the power generation. In the previous Malaysian Plan, it was stated that five percent of the Malaysian National Energy Limited's (Tenaga Nasional Berhad (TNB)) energy would come from a green source (renewable energy). But this was not achieved. However, in the latest Malaysian Plan, the amount was reduced to 350,000 megawatts which is not even three percent. Currently, only 20 megawatts of energy comes from the green source which is through the CDM projects.

*The problem here is TNB is not willing to pay much for the renewable energy and this has been it unattractive to the independent energy suppliers to embark on clean energy. However, the previous Minister of Science, Technology and Environment, Dato' Seri Dr.*Lim Keng *Yaik said that TNB will buy clean energy at an attractive price.*

2) In order to take measures to be adaptable, what is your opinion about having a national policy that focuses solely on climate change?

Yes. However, currently the climate change problem has not been taken seriously by the Government. The Cabinet Committee on Climate Change which is chaired by the Prime Minister and consists of cabinet ministers has not even met once. There is no Non-Government Organization (NGO) representation there. The National Climate Change Committee has not been meeting regularly lately and it focuses only on CDM. There is no non-governmental organization (NGO) representation in this committee which has caused some concerned among the NGOs. There is another committee called the National Steering Committee on Climate Change which has met before but not on a regular basis and this committee has not been viewed as being effective.

3) Should Malaysia do more in the area of science in climate change by proving local data to confirm the change of climate, thus creating the sense of urgency in the international arena to take appropriate action to reduce this change?

Yes. It is difficult to get data. Furthermore, it requires a lot of investment in terms of money.

4) What is your opinion on the following measures to reduce carbon emission?

a) Setting its carbon dioxide emissions reduction target, perhaps by year 2020.

Yes but this should be done carefully because it may not go well with G77 and NAM. . The G77 countries may not react positively to this because the developed countries will use this as a precedent to force other developing countries to follow Malaysian example of setting a target. This may cause a diplomatic problem especially with the G77 countries.

b) Passing new laws to combat climate change. Which area should this law cover?

Yes.

c) Having a better system of governance and tighter enforcement. How can this be done?

Yes with the support of the government.

d) Transportation

a. Improving the public transport

This is the best way to help reduce the change in climate. Car is a status symbol in Malaysia. The government should strive to make public transportation in Malaysia especially in Kuala Lumpur reliable and affordable so that more people will start using it. Malaysia needs to learn how Singapore has made their public transport system so reliable and efficient. Currently there are too many government agencies that are overseeing the public transportation in Malaysia.

b. Stricter checks on Buses, Taxis and Lorries by PUSPAKOM

This is not a major threat.

c. Encourage car pool – collaboration between Information Ministry, Transport Ministry and NRE.

This is a good idea. It is a problem in terms of managing it. It will not sustain.

d. Encourage hybrid cars – collaboration between NRE, Transport Ministry, Finance Ministry & Information Ministry- create awareness and reducing taxes

Current hybrid cars operate on a dual mode. They still use petrol. It is better to develop a hybrid car which uses clean energy.

e. Do more to encourage usage of gas in cars? Natural Gas Vehicles

It is still fossil fuel. Better to use renewable energy. Hydrogen is the gas to replace carbon but when will it be available.

e) Encourage the use of alternative form of energy rather than fossil fuel

a. What is your opinion about nuclear energy? TAR suggested it

Not a good idea because there is no proper waste disposal method available now. It is not safe. It is not climate neutral. The mining of uranium will create more environmental problems.

b. Giving incentives for the development and use of renewable energy such as solar, biomass or wind.

Wind – Malaysia does not have strong winds.

Biomass – has potential but if bio diesel then it is still fossil fuel. It is a good idea if it is based on agriculture waste but not raw palm or soya because then there has to be more deforestation to plant palm or soya.

Solar – it is expensive.

f) Malaysia should have new laws and tighter enforcement on open burning which should include having laws that punish Malaysian companies who are responsible for haze in other countries.

This is not a climate issue. It is a transboundary issue. We should not plant palm oil trees on pit soil because the fire cannot be stopped and it creates a major carbon emission problem.

g) Have mitigation strategies in the agriculture sector to reduce/offset GHG emission e.g. carbon sequestration in agricultural soils or use of tree shelterbelts – minimize soil erosion and stabilize soil carbon.

Carbon sequestration is not approved by the UNFCCC. The problem is it involves high capital cost. Tree shelterbelts are not a good idea. Tree shelterbelts may not make much difference because there are issues on planting and managing them.

h) Take measures in the Manufacturing Sector to reduce emission by

a. energy efficiency

They should pay the market price for the energy they consume. They should not be given subsidy. Only then, will they take measures to conserve energy. Energy efficiency must be climate friendly.

b. Fuel switching

Depend on the choices available.

c. Monitoring

Yes this should be done.

d. Waste management

Yes this should be done.

e. Train employees

Yes this should be done.

i) Take measures to increase carbon sink by reduced deforestation

Yes this should be done.

5) Though there have been campaigns organized by the public and private sectors and non-governmental organizations but according to the Conservation and Environmental Management Division (CEMD) of the Ministry of Natural Resources and Environment (NRE), the response has been lukewarm. Therefore, a different approach and strategy should be undertaken.

a. What is your opinion about collaboration between various Ministries such as the Education Ministry, the Information Ministry, Transport Ministry, the Human Resources Ministry and the Ministry of Natural Resources and Environment in order to create awareness among Malaysians about climate change?

This is a good measure. However, this has been very frustrating because the Government hardly did anything previously.

b. What is your opinion about the Ministry of Natural Resources and Environment collaborating with the Human Resource Ministry to encourage and help them create training programmes on the importance of taking measures to reduce climate change?

This is a good measure.

c. What is your opinion about

i. the Education Ministry and the Ministry of Natural Resources and Environment collaborating in order to create awareness among students?

This is a good measure.

ii. having a subject on climate change at the primary, secondary and tertiary level of school to increase public education and awareness with regard to global warming and climate change matters.

This is a good measure.

6) What is your opinion about the CDM? How is the response so far? Is Malaysia doing enough in terms of awareness and areas?

In ASEAN, Malaysia is leading. In forestry, the response is poor. In agriculture, there is no big deal. To be successful, there must be technology transfer. There must be long term benefits.

b. What is your opinion about the Ministry of Natural Resources and Environment collaborating with the Human Resource Ministry to encourage and help them create training programmes on the importance of taking measures to reduce climate change?

This is a good measure.

c. What is your opinion about

i. the Education Ministry and the Ministry of Natural Resources and Environment collaborating in order to create awareness among students?

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This is a good measure.

6) What is your opinion about the CDM? How is the response so far? Is Malaysia doing enough in terms of awareness and areas?

In ASEAN, Malaysia is leading. In forestry, the response is poor. In agriculture, there is no big deal. To be successful, there must be technology transfer. There must be long term benefits.

Interview 5

Name: Mr. Maximilian T. Conrad, Assistant Secretary from the Environmental Management and Conservation Division, Ministry of Natural Resources and Environment (NRE)

Date: 30th March 2009

Location: Bangsar Village II, Bangsar, Kuala Lumpur

1. Do you agree that any action taken should focus on three main strategies - mitigation, science and vulnerability (adaptability)?

   Yes

2. In order to take measures to be adaptable, what is your opinion about having a national policy that focuses solely on climate change?

   Cabinet Committee on Climate Change should meet some time this year with the new Prime Minister taking office in April 2009. Currently, various workshops are currently being held with various ministries, government agencies and non-governmental organizations on the proposed climate change policy. I am very optimistic that it will be ready at the end of this year. At the government level, the responsibility to curb climate change in Malaysia should be streamlined.

3. Should Malaysia do more in the area of science in climate change by proving local data to confirm the change of climate, thus creating the sense of urgency in the international arena to take appropriate action to reduce this change?

   No comments.

4. What is your opinion on the following measures to reduce carbon emission?

a) Setting its carbon dioxide emissions reduction target, perhaps by year 2020.

No. A voluntary carbon offset scheme is preferred like the one used by the Malaysian Airlines System (MAS).

b) Passing new laws to combat climate change. Which area should this law cover?

No comments.

c) Having a better system of governance and tighter enforcement. How can this be done?

No comments.

d) Transportation

a. Improving the public transport

Yes

b. Stricter checks on Buses, Taxis and Lorries by PUSPAKOM

Yes

c. Encourage car pool – collaboration between Information Ministry, Transport Ministry and NRE.

Yes

d. Encourage hybrid cars – collaboration between NRE, Transport Ministry, Finance Ministry & Information Ministry- create awareness and reducing taxes

Yes

e. Do more to encourage usage of gas in cars? Natural Gas Vehicles

Yes

e) Encourage the use of alternative form of energy rather than fossil fuel

a. What is your opinion about nuclear energy? TAR suggested it

No comments.

b. Giving incentives for the development and use of renewable energy such as solar, biomass or wind.

No comments.

f) Malaysia should have new laws and tighter enforcement on open burning which should include having laws that punish Malaysian companies who are responsible for haze in other countries.

No comments.

g) Have mitigation strategies in the agriculture sector to reduce/offset GHG emission e.g. carbon sequestration in agricultural soils or use of tree shelterbelts – minimize soil erosion and stabilize soil carbon.

No comments.

h) Take measures in the Manufacturing Sector to reduce emission by

a. energy efficiency

No comments.

b. Fuel switching

No comments.

c. Monitoring

No comments.

d. Waste management

No comments.

e. Train employees

No comments.

i) Take measures to increase carbon sink by reduced deforestation

Yes

5. Though there have been campaigns organized by the public and private sectors and non-governmental organizations but according to the Conservation and Environmental Management Division (CEMD) of the Ministry of Natural Resources and Environment (NRE), the response has been lukewarm. Therefore, a different approach and strategy should be undertaken.

   a. What is your opinion about collaboration between various Ministries such as the Education Ministry, the Information Ministry, Transport Ministry, the Human Resources Ministry and the Ministry of Natural Resources and Environment in order to create awareness among Malaysians about climate change?

      Creating awareness among the public about the importance of taking measures to reduce the change in climate is one of the best ways to reduce climate change.

   b. What is your opinion about the Ministry of Natural Resources and Environment collaborating with the Human Resource Ministry to encourage and help them create training programmes on the importance of taking measures to reduce climate change?

      Good idea.

   c. What is your opinion about

      i. the Education Ministry and the Ministry of Natural Resources and Environment collaborating in order to create awareness among students?

         Good idea.

      ii. having a subject on climate change at the primary, secondary and tertiary level of school to increase public education and awareness with regard to global warming and climate change matters.

         Good idea.

6. What is your opinion about the CDM? How is the response so far? Is Malaysia doing enough in terms of awareness and areas?

   No comments.